

ORDER NO.DSD0503043C3

Service Manual

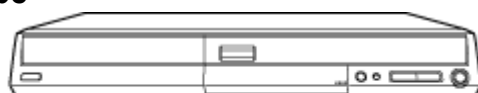
DVD Video Recorder

DMR-EH50GN

Vol.1

Colour

(S).....Silver Type



Notes: This model's DVD Drive is VXY1872.

Introduction

This service manual contains technical information which will allow service personnel's to understand and service this model.

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplement service manual to be filed with original service manual.

1) This service manual does not contain the following information, because of the impossibility of servicing at component level.

- * Schematic Diagram, Block Diagram and P.C.B. layout of Digital P.C.B.
- * Parts List for individual parts of Digital P.C.B.
- * Exploded View and Parts List for individual parts of RAM drive.

2) The following category are recycle module part. Please send them to Central Repair Center.

- * Digital P.C.B. (RFKBEH50GN)
- * RAM drive (VXY1872)

Specifications

Power supply	AC220-240 V, 50 Hz		Video Output: (PAL/NTSC)		AV1/AV2(21pin x 2), LINE(pin jack x 1) 1.0Vp-p ; 75Ω
Power consumption	31 W		S-Video Out: (PAL/NTSC)		AV1(21pin), S connector x 1 Y:1.0Vp-p ; 75Ω, C:0.3Vp-p ; 75Ω
Recording system	DVD video recording format (DVD-RAM), DVD video format (DVD-R), DVD video format (DVD-RW)		RGB Out: (PAL/NTSC)		AV1(21pin), 0.7Vp-p ; 75Ω
Optical pick-up	System with 1 lens, 2 integration units (662 nm wavelength for DVDs, 795 nm wavelength for CDs)		Component video out: (NTSC 480P/480i) (PAL 576P/576i)		Y: 1.0Vp-p ; 75Ω(pin jack) PB: 0.7Vp-p ; 75Ω(pin jack) PR: 0.7Vp-p ; 75Ω(pin jack)
Recordable discs	DVD-RAM		Antenna reception system		Australia (PAL-B) New Zealand (PAL-BG) VHF: CH 0-CH 12 UHF: CH 28 - CH 69 CATV: CH 45MHz - 470MHz
	• Ver.2.0 Ver.2.1/3x-SPEED DVD-RAM Revision 1.0 • Ver.2.2/5x-SPEED DVD-RAM Revision 2.0				
	DVD-R				
	• For General Ver.2.0 • For General Ver.2.0/4X-SPEED DVD-R Revision 1.0 • For General Ver.2.x/8X-SPEED DVD-R Revision 3.0		RF Converter Output		Not provided
	DVD-RW				
	• Ver.1.1 • Ver.1.1/2x-SPEED DVD-RW Revision 1.0 • Ver.1.2/4X-SPEED DVD-RW Revision. 2.0				
Internal HDD capacity	+R		SD card slot		
	• Ver.1.0, Ver.1.1, Ver.1.2		Still Picture (JPEG, TIFF)		SD memory card slot: 1pc
Quick Start for Recording (Quick Start: ON)	80GB		Compatible Media		SD memory card/Multi Media Card (Includes miniSD™ cards. (A miniSD™ card adapter needs to be inserted.)
	1 Sec. Quick Start for Recording on DVD-RAM* *From the power off state, for recording on DVD-RAM starts about 1 second after first pressing the power button and then sequentially pressing the REC button (Quick Start Mode).		Format		FAT12, FAT16
Recording time (Approx.)	Max. 8 hours (using 4.7 GB disc) XP: 60 minutes SP: 120 minutes LP: 240 minutes EP: 360 minutes or 480 minutes Max.142 hours with HDD (EP 8H mode)		Image file format		• JPEG conforming to DCF (Design rule for Camera File system) (sub sampling; 4:2:2 or 4:2:0) • TIFF (Uncompressed RGB chunky) • DPOF Compatible
			Number of pixels		34 × 34 to 6144 × 4096
Region number	Region No.4		Thawing time		Approx. 7sec (2M pixels)
Discs played	DVD-RAM		Audio system		
	DVD-R		Recording system		Dolby Digital 2ch
	DVD-RW		Analog Input		AV1/AV2(21pin x 2), AV3/AV4(pin jack x 2) Standard input: 0.5 Vrms Full scale: 2.0 Vrms at 1KHz Input impedance: More than 10KΩ
	+R		Analog Output		AV1/AV2(21pin x 2), LINE (pin jack x 1) Standard output: 0.5 Vrms Full scale: 2.0 Vrms at 1KHz Output impedance: Less than 1.0KΩ
	+RW		Number of channels		Recording: 2 channels Playback: 2 channels
	DVD-Video, DVD-Audio, Video CD, CD-Audio (CD-DA) CD-R/RW (MP3, CD-DA, Video CD, JPEG formatted discs)		Digital Output		Digital Audio Optical Output Connector (PCM, Dolby Digital, DTS, MPEG)
Compression Method	MP3		Dimensions		Approx. 430 (W) x 63 (H) x 350.5 (D) mm [Approx. 16 15/16" (W) x 2 1/2" (H) x 13 13/16" (D)] (excluding protrusions)
	Format : ISO9660 level1 or 2(except for extended formats), Joliet Compatible compression rate : 32kbps ~ 320kbps Compatible sampling rate : 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz This unit is not compatible with ID3 tags.		Mass		Approx. 4.4kg (9.92 lbs)
	CD (JPEG)		Operating temperature		5°C - 40°C (41 F - 104 F)
	Format : ISO9660 level1 or 2(except for extended formats), Joliet Compatible pixels : between 34 × 34 and 6144 × 4096 pixels Sub sampling 4:2:2 or 4:2:0 This unit is not compatible with MOTION JPEG.		Operating humidity range		10 %-80 % RH (no condensation)
	MP3, CD (JPEG) Common Items		Clock unit		Quartz-controlled 12-hour digital display
	Maximum number of folders : 99 (one disc) Maximum number of files : 999 (one disc) This unit is compatible with multi-session. This unit is not compatible with packet writing.		LASER Specification (Class I LASER Product)		
			Wave length		795 nm(CDs), 662 nm(DVDs)
			Laser power		No hazardous radiation is emitted with the safety protection.
	Video system		Power consumption in standby mode		approx. 3.0 W
	TV system		Solder		This model use lead free solder (PbF).
Recording system					
Video Input	Video In: (PAL/NTSC)	AV1/AV2(21pin x 2), AV3/AV4(pin jack x 2) 1.0Vp-p ; 75Ω			
	S-Video In: (PAL/NTSC)	AV2(21pin), AV3/AV4(S connector x 2) Y:1.0Vp-p ; 75Ω, C:0.3Vp-p ; 75Ω			
	RGB In(PAL):	AV2(21pin) 0.7Vp-p ; 75Ω			

Notes : Mass and dimensions are approximate.
Specifications are subject to change without notice.

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WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

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1 Safety precautions

1.1 General guidelines

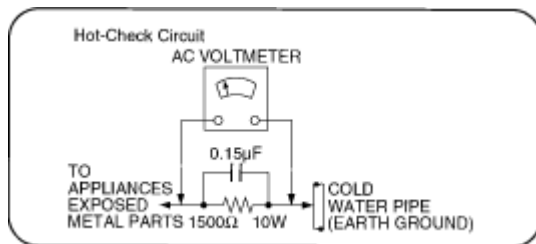
1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1 Leakage current cold check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1\text{M}\Omega$ and $5.2\text{M}\Omega$.

When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

Figure 1



1.1.2 Leakage current hot check

(See Figure 1 .)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a $1.5\text{k}\Omega$, 10 watts resistor, in parallel with a $0.15\mu\text{F}$ capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1 .
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliampere. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

2 Prevention of Electrostatic Discharge (ESD) to Electrostatic Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatic Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistor-and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).


1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

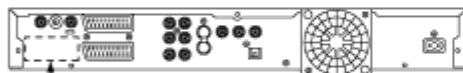
3 Precaution of Laser Diode

CAUTION:

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 662 nm (DVDs) /795 nm (CDs)
Maximum output radiation power from pickup: 100 μ W/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.



LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

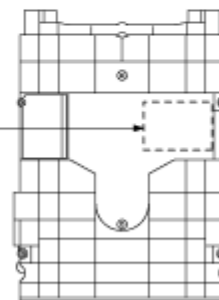


ACHTUNG:

Dieses Produkt enthält eine Laserdiode.
Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.
Wellenlänge: 662 nm (DVDs) /795 nm (CDs)
Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE

Die Strahlungen der Lasereinheit ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.



DAANGER	- VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.	FOR 31 0195
CAUTION	- VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.	RECEIVED 11
ATTENTION	- VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.	RECEIVED 11
ADVARSEL	- STRÅLING OG USYNLIK LASERSTRÅLING NÅR DEKKSEL ÅPNEDES. UNNGÅ DIREKTE EKSP. TIL STRÅLINGEN.	
VARO!	- AISTUVALLA OYTTÄHTÄVÄ NÄR KANSI ON AVKÄNNUKSEN LASKAVALTAVALLA ALA KATSO SUORAAN.	
WARNING	- STRÅLING OG USYNLIK LASERSTRÅLING NÄR DEKKSEL ÅPNEDES. UNNGÅ DIREKTE EKSP. TIL STRÅLINGEN.	
ADVARSEL	- STRÅLING OG USYNLIK LASERSTRÅLING NÄR DEKKSEL ÅPNEDES. UNNGÅ DIREKTE EKSP. TIL STRÅLINGEN.	
POISBOTT	- ECHTSUUR OCH UZICHTBAAR LASERSTRÅLING NÄR DEKKSEL ÅPNET. UNNGÅ DIREKTE EKSP. TIL STRÅLINGEN.	
注意	- 打开时有可能发出不可见激光辐射。避免激光辐射。	
注意	- 打开时有可能发出不可见激光辐射。避免激光辐射。	FOR 31 0195

CAUTION!

THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN
THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

4 Handling the Lead-free Solder

4.1 About lead free solder (PbF)

Distinction of PbF P.C.B.:

P.C.B.s (manufactured) using lead free solder will have a PbF stamp on the P.C.B.

Caution:

- Pb free solder has a higher melting point than standard solder; Typically the melting point is 50 - 70°F (30 - 40°C) higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C).
- Pb free solder will tend to splash when heated too high (about 1100°F/600°C).
- When soldering or unsoldering, please completely remove all of the solder on the pins or solder area, and be sure to heat the soldering points with the Pb free solder until it melts enough.

5 Each Button



6 New Feature

6.1 Quick start function(REC)

1. General

A few seconds after tuning on the unit, you can start recording to DVD-RAM, HDD.

You can switch the operation of this function (ON/OFF) on the menu screen. .

2. Quick start(REC) principle

In the power-off at Quick start, only power supplies for video IC, tuner and storage media are cut off.

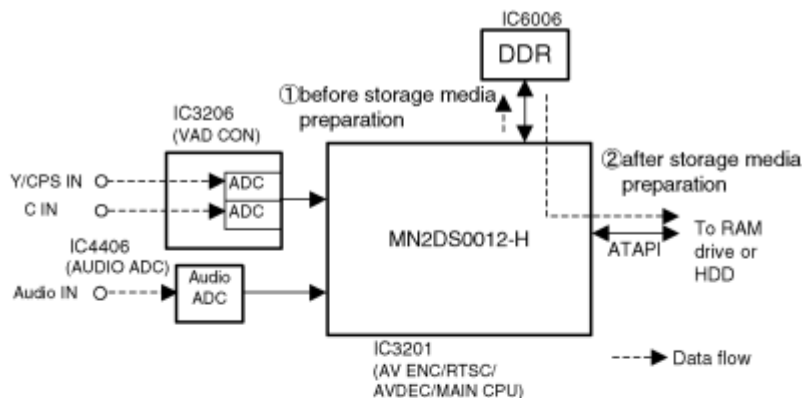
① When the REC button is pushed a few second after the power button is pushed, Audio and Video data are stored in

DDR SDRAM before a storage media(DVD-RAM or HDD) preparation.

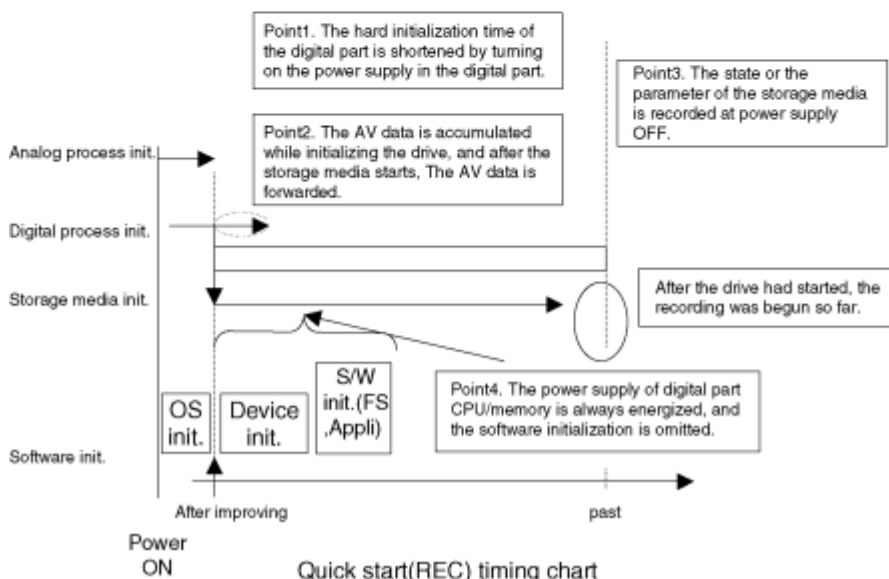
*Preparation time → DVD-RAM: About 8seconds

HDD: about 18seconds

② After a storage media(DVD-RAM or HDD) preparation, Audio and Video data are transfer from DDR SDRAM to the storage media.



Quick start(REC) explanation chart



Quick start(REC) timing chart

7 Taking out the Disc from RAM-Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button

7.1 Forcible Disc Eject

7.1.1 When the power can be turned off.

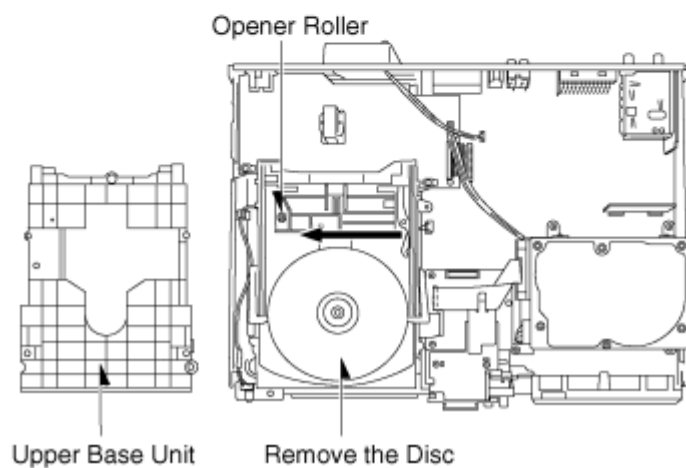
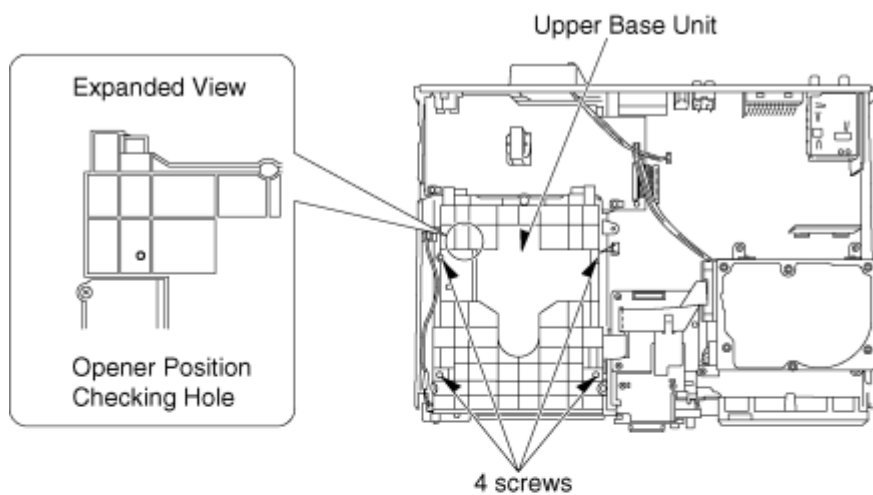
1. Turn off the power and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

7.1.2 When the power can not be turned off.

1. Press [POWER] key on the front panel for over 10 seconds to turn off the power forcibly, and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

7.2 When the Forcible Disc Eject can not be done.

1. Turn off the power and pull out AC cord.
2. Remove the Top Case.
3. Remove the Front Panel.
4. Remove 4 screws and Upper Base Unit from DVD-RAM Drive.
5. Take out the disc and put the Opener Roller on fully position for direction of Arrow.
6. Put the Upper Base Unit so that the Opener Roller is inserted into the groove.
7. Check Opener Roller is seen through the Opener position Checking Hole, and tighten 4 screws.



8 Service Explorer

Confirm "RAM-Drive Last Error" in Service Mode

Execute Service Mode

1. Press [REC], [CH UP] and [OPEN/CLOSE] simultaneously for 5 seconds when P-off.
FL Display:

SERVICE MODE

*After finishing display "(7). Factor of Drive Error occurring", press [0] [2] ~[1] [9] keys of the Remote Controller so that 19 memories can be displayed as maximum.

2. Press [4] [2] keys of remote controller.

Example of FL Display:

- (1) Error Number is displayed for 5 seconds.

NO 01

- (2) Time when the error has occurred is displayed for 5 seconds.

50216191526

The error has occurred at 2005(year)/Feb.(month)/16(day)/19(hour):15(minute):26(second)

- (3) Last Drive Error (1/2) is displayed for 5 seconds.

03 1000

Error Sense
key

00: Bad disc
03: Bad disc
04: Bad disc or RAM-Drive malfunction

When above error codes are displayed, confirm operation with Panasonic RAM disc or Panasonic DVD-R disc.
*If the operation is OK, judge the error is due to media.
*If the operation is NG and symptom as BLOCK NOISES and so on that are particular symptom of Digital appears, judge the error is due to RAM-Drive or Digital PCB.

- (4) Last Drive Error (2/2) is displayed for 5 seconds.

00 13 00 00

*This error code is unnecessary for service.

- (5) Error occurring Disc type is displayed for 5 seconds.

MEDIA DVDR

Disc type

*The error disc cannot be specified, display as "DVD".

- (6) Disc Maker's ID is displayed for 5 seconds.

MXL R 061

Example of Disc Maker's ID:

DVD-R Disc

No.	FL Display (Disc Maker's ID)	Disc Maker	Country
1	MEI	Panasonic	Japan
2	PVC	Pioneer	Japan
3	MCC	Mitsubishi Chemical Corporation	Japan

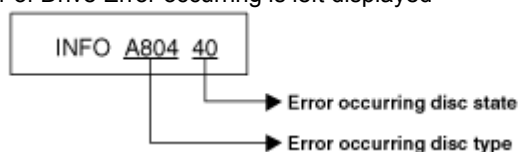
4	TDK	TDK	Japan
5	MXL	Maxell	Japan
6	MCI	MITUI CHEMICALS	Japan
7	JVC	Victor JVC	Japan
8	TAIYOYUDEN TYG	Taiyo yuden	Japan
9	GSC	Giga Storage	Taiwan
10	PRODISC	Prodisc	Taiwan
11	PRINCO	PRINCO	Taiwan
12	RITEK	RITEK	Taiwan
13	OPTDISC	OPTDISC	Taiwan
14	LEAD DATA	LEAD DATA	Taiwan
15	CMC	CMC	Taiwan
16	AUVISTAR	AUVISTAR	Taiwan
17	ACER	Acer	Taiwan
18	VIVASTAR	VIVASTAR	Switzerland
19	LGE	LG Electronics	Korea

DVD-RAM Disc

No.	FL Display (Disc Maker's ID)	Disc Maker	Country
1	MEI	Panasonic	
2	MATSUSHITA	Panasonic	Japan
3	MXL	Maxell	Japan
4	PRODISC	Prodisc	Taiwan
5	OPTDISC	OPTDISC	Taiwan
6	CMC	CMC	Taiwan

*Since an display is arbitrarily set up by the disk producer side, the above-mentioned display may be changed.
Please make it reference as an example of a display.

(7) Factor of Drive Error occurring is left displayed



Error Occurring Disc Type

FL Display	Disc Type
00	DVD-ROM/Video
01	Audio-CD
02	2.6GB DVD-RAM
03	4.7GB DVD-RAM
04	DVD-R

Error Occurring Disc State

FL Displays (Hexadecimal)	Description			
	Disc distinction state	Cartridge disc state	Cartridge disc state	Disc size
00	OK	With cartridge	Has not been opened yet.	12 cm
10	OK	With cartridge	Has not been opened yet.	8 cm
20	OK	With cartridge	Has been opened.	12 cm
30	OK	With cartridge	Has been opened.	8 cm
40	OK	Bare	Has not been opened yet.	12 cm
50	OK	Bare	Has not been opened yet.	8 cm
60	OK	Bare	Has been opened.	12 cm
70	OK	Bare	Has been opened.	8 cm
80	NG	With cartridge	Has not been opened yet.	12 cm
90	NG	With cartridge	Has not been opened yet.	8 cm
A0	NG	With cartridge	Has been opened.	12 cm
B0	NG	With cartridge	Has been opened.	8 cm
C0	NG	Bare	Has not been opened yet.	12 cm
D0	NG	Bare	Has not been opened yet.	8 cm
E0	NG	Bare	Has been opened.	12 cm
F0	NG	Bare	Has been opened.	8 cm

9 Self-Diagnosis and Special Mode Setting

9.1 Self-Diagnosis Functions

Self-Diagnosis Function provides information for errors to service personnel by "Self-Diagnosis Display" when any error has occurred.

U, H** and F** are stored in memory and held.**

You can check latest error code by transmitting [0] [1] of Remote Controller in Service Mode.

Automatic Display on FL will be cancelled when the power is turned off or AC input is turned off during self-diagnosis display is ON.

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
U30	Remote control code error	Display appears when main unit and remote controller codes are not matched.	No display	<div>REMOTE DVD*</div> <p>"" is remote controller code of the main unit. Display for 5 seconds.</p>
U59	Abnormal inner temperature detected	Display appears when the drive temperature exceeds 70°C. The power is turned off forcibly. For 30 minutes after this, all key entries are disabled. (Fan motor operates at the highest speed for the first 5 minutes. For the remaining 25 minutes, fan motor is also stopped.) The event is saved in memory as well.	No display	<div>U59</div> <p>"U59 is displayed for 30 minutes.</p>
U99	Hang-up	Displayed when communication error has occurred between Main microprocessor and Timer microprocessor.	No display	<div>U99</div> <p>Displayed is left until the [POWER] key is pressed.</p>
H19	Inoperative fan motor	When inoperative fan motor is detected after powered on, the power is turned off automatically. The event is saved in memory.	No display	No display
F00	No error information	Initial setting for error code in memory (Error code Initialization is possible with error code initialization and main unit initialization.)	No display	No display
F58	Drive hardware error	When drive unit error is detected, the event is saved in memory.	No display	No display
F34	Initialization error when main microprocessor is started up for program recording	When initialization error is detected after starting up main microprocessor for program recording, the power is turned off automatically. The event is saved in memory.	No display	No display
UNSUPPORT	Unsupported disc error	<p>*An unsupported format disc was played, although the drive starts normally.</p> <p>*The data format is not supported, although the media type is supported.</p> <p>*Exceptionally in case of the disc is dirty.</p>	"This disc is incompatible."	<div>UNSUPPORT</div> <p>Display for 5 seconds.</p>
NO READ	Disc read error	<p>*A disc is flawed or dirty.</p> <p>*A poor quality failed to start.</p> <p>*The track information could not be read.</p>	"Cannot read. Please check the disc."	<div>NOREAD</div> <p>Display for 5 seconds.</p>
HARD ERR	Drive error	The drive detected a hard error.	" DVD drive	

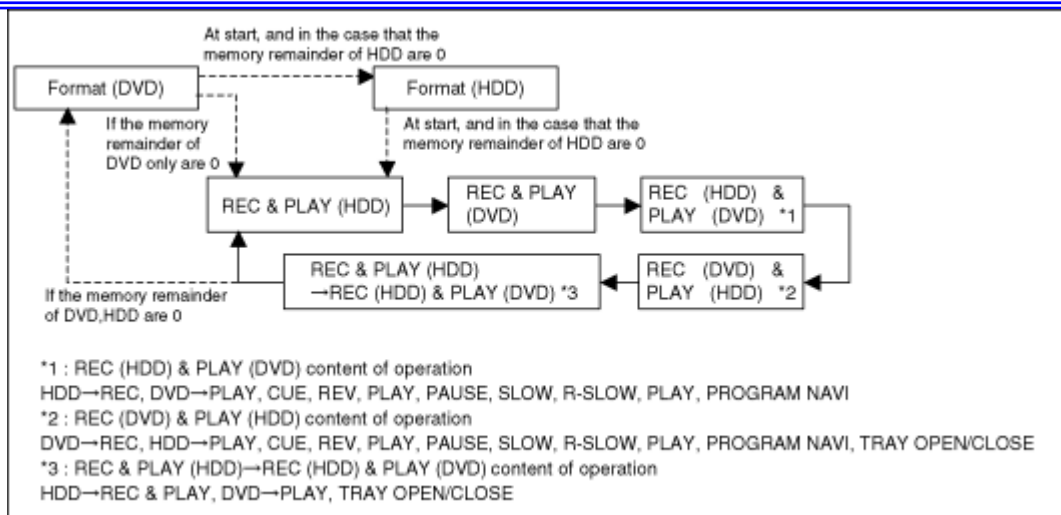
			error."	HARD ERR Display for 5 seconds.
SELF CHECK	Restoration operation	Since the power cord fell out during a power failure or operation, it is under restoration operation. *It will OK, if a display disappears automatically. If a display does not disappear, there is the possibility that defective Digital P.C.B. / RAM drive.	No display	SELF CHECK
Full Program	32 programs are already set.	32 programs are already set.	No display	PROG FULL
UNFORMAT	Unformatted disc error	You have inserted an unformatted DVD-RAM or DVD-RW that is unformatted or recorded on other equipment. If you will use this disc, format is necessary. But, all program recorded on this disc will be deleted.	Format This disc is not formatted properly. Format the disc in DISK MANAGEMENT?	UNFORMAT
PLEASE WAIT	Unit is in termination process	Unit is in termination process now. "BYE" is displayed and power will be turned off. In case "Quick Start" of setup menu is ON, it is displayed in restoration operation for AC off.	No display	PLEASE WAIT

9.2 Special Modes Setting

Item		FL display	Key operation
Mode name	Description		Front Key
TEST Mode	*All the main unit's parameters (include tuner) are initialized.	TEST AV1	Press [STOP], [CH UP] and [OPEN/CLOSE] keys simultaneously for 5 seconds when power is off.
Rating password	The audiovisual level setting password is initialized to "Level 8".	INIT	Open the tray, and press [REC] and [PLAY] simultaneously for 5 seconds. NOTE: Drive should be selected to DVD.
Service Mode	Setting every kind of modes for servicing. *Details are described in "9.3. Service Mode".	SERVICE MODE	When the power is off, press [CH UP], [OPEN/CLOSE] and [REC] keys simultaneously for 5 seconds.
Forced disc eject	Removing a disc that cannot be ejected. The tray will open and unit will shift to P-off mode. *When Timer REC is ON, execute "Forced disc eject" after releasing Timer REC. *This command is not effective during "Child lock" is ON. While Demonstration Lock is being set, this Forced disc eject function is not accepted. If this command was executed while TIMER REC is being set, TIMER REC setting will be kept.	The display before execution leaves. *****	When the power is off, press [STOP] and [CH UP] keys simultaneously for 5 seconds.
Child lock/unlock	Set or release "Child Lock".	X HOLD	Press [ENTER] and [RETURN] by remote controller simultaneously until [X-HOLD] is displayed.
NTSC/PAL system select	To switch PAL/NTSC alternately.	The display before execution leaves.	While the power is on (E-E mode), press [STOP] and [OPEN/CLOSE] simultaneously for 5 seconds.

Forced power-off	When the power button is not effective while power is ON, turn off the power forcibly. *When Timer REC is ON, execute "Forced Power-off" after releasing Timer REC.	Display in P-off mode.	Press [Power] key over than 10 seconds.
Aging	Perform sequence of modes as * Aging Description shown below continually. <div>Caution: All programs in HDD and DVD-RAM disc will be deleted because Formatting is done once in Aging process.</div>	Display following the then mode.	When the power is ON, press [STOP], [POWER] and [OPEN/CLOSE] simultaneously for over 5 seconds and less than 10 seconds. NOTE1: If Unit has not turned into Aging mode by operations shown above, execute TEST MODE once and re-execute operation shown above. (*All the main unit's parameters include tuner are initialized by TEST mode.) NOTE2: If the unit has hung-up because of pressing keys for over 10 seconds, once turn off the power, and re-execute this command. *When releasing Aging mode, press [POWER] key.

Aging Contents (Example):



Demonstration lock/unlock	Ejection of the disc is prohibited. The lock setting is effective until unlocking the tray and not released by "Main unit initialization" of service mode.	*When lock the tray. <div>LOCK</div> "LOCK" is displayed for 3 seconds.	When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds.
		*When unlock the tray. <div>UNLOCK</div> "UNLOCK" is displayed for 3 seconds.	When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds.
		*When press OPEN/CLOSE key while the tray being locked.	Press [OPEN/CLOSE] key

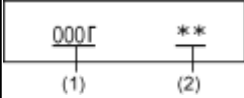
		<div>LOCK</div>	while the tray being locked.
ATP re-execution	Re-execute ATP.	Display "LOCK" for 3 seconds. <div>*****</div>	When the power is on (E-E mode), press [CH UP] and [CH DOWN] simultaneously for 5 seconds.
Progressive initialization	The progressive setting is initialized to Interlace.	The display before execution leaves. <div>*****</div>	When the power is on (E-E mode), press [STOP] and [PLAY] simultaneously for 5 seconds.

9.3 Service Modes

Service mode setting: While the power is off, press **REC, CH UP and OPEN / CLOSE** simultaneously for five seconds.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Release Items	Item of Service Mode executing is cancelled.	<div>SERVICE MODE</div>	Press [0] [0] or [Return] in service mode.
Error Code Display	Last Error Code of U/H/F held by Timer is displayed on FL. *Details are described in "9.1. Self-Diagnosis Functions" .	<div>♣ □ □</div> *♣ shows U/H/F. □ □ shows number.	Press [0] [1] in service mode
ROM Version Display	Region code, MAIN firm version, TIMER firm version and DRIVE firmware versions are displayed on FL for five seconds per each version in order, but ROM version will be left displayed.	<div>REGION*</div> <div>MAIN *****</div> <div>TIMER*****</div> <div>DRIVE ****</div> <div>ROM * ***</div> ("*") are version displays.	Press [0] [2] in service mode
White Picture Output	White picture is output as component Output from AV Decoder. *White picture (Saturation rate : 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". <div>WHIT I</div>	Press [1] [1] in service mode.
		Switch Interlace/Progressive <div>WHIT P</div>	Press [1] [4] in White Picture Output mode. *I/P are switched alternately.
Magenta Picture Output	Magenta picture is output with Component Output from AV Decoder. *Magenta picture (Saturation rate: 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". <div>MAGE I</div>	Press [1] [2] in service mode.
		Switch Interlace/Progressive <div>MAGE P</div>	Press [1] [4] in Magenta Picture Output mode. *I/P are switched alternately.
RTSC Return in XP (A & V)	AV1 input signal is encoded (XP), decoded (XP) and output decoded signal to external without DISC recording and DISC playback.	Initial mode: EE2/ Interlace/ XP/ Audio 48kHz <div>EE2 I XP 48</div>	Press [1] [3] in service mode.
		Switch Interlace/Progressive <div>EE2 P XP 48</div>	Press [1] [4] in RTSC Return XP mode. *I/P are switched alternately.
		Audio 44.1 kHz/ 48 kHz	Press [2] [4] in RTSC

		Switch EE2 P XP 44	Return XP mode. *48 kHz / 44.1 kHz are switched alternately.
I/P Switch	Switch Interlace and Progressive in EE mode. *Initial setting is "Interlace". *This command is effective during executing "White Picture Output", "Magenta Picture Output" and "RTSC Return in XP (A & V)" modes.	Initial mode is Interlace SERVICE I Switch Interlace/Progressive SERVICE P	Press [1] [4] in I/P Switch mode. *I/P are switched alternately.
Audio Mute (XTMUTE)	Check whether mute is applied normally by the timer microprocessor.	TIMER MUTE	Press [2] [1] in service mode.
Audio Mute (XDMUTE)	Check whether mute is applied normally by the Digital P.C.B..	MAIN MUTE	Press [2] [2] in service mode.
Audio Pattern Output	The audio pattern stored in the internal memory is output (Lch: 1kHz/-18dB) (Rch: 400Hz/-18dB) *Audio sound clock switching operation of DAC can be confirmed by sub command [2] [4].	Initial mode (Audio 48kHz) AUDIO 48	Press [2] [3] in service mode.
		Audio 44.1kHz/48kHz switching AUDIO 44	Press [2] [4] in Audio Pattern Output mode. *48 kHz / 44.1 kHz are switched alternately.
HDD READ inspection	Perform a complete read inspection of the HDD.	When the HDD is OK HDD RDOK If the HDD is defective HDD RDNG□□□ □ :Judge of Forward rate. *When normal (Forward rate is 35Mbps or more, and there is no HDD error):□ is Space. *When Abnormal (Forward rate is less than 35Mbps or HDD error existing):□ is X. □□ :Number of what have spent time for seeking is over 100ms. *When normal:□□ are spaces. *When Abnormal: Display Number of what have spent time for seeking over 100ms. However, if the number is more than 100, display [XX]. We judge it is normal that the number is less than 4.	Press [3] [1] in the service mode. *When canceling the checking mode while executing, do "forced power-off". Method: Press the "POWER" button more than 10 seconds.
Laser Used Time Indiction	Check laser used time (hours) of drive.	LASER***** •(*****) is the used time display in hour. •Laser used time of DVD/ CD in Playback/Recording mode is counted.	Press [4] [1] in service mode.
Delete the Laser Used Time	Laser used time stored in the memory of the unit is deleted.	CLR LASER	Press [9] [5] in service mode.
		1. Error Number is displayed for 5 seconds. NO ** 2. Time when the error has occurred is displayed for 5 seconds. YMMDDhhmmss Y: Year MM: Month DD: Day hh: Hour	

RAM Drive Last Error	<p>RAM Drive error code display.</p> <p>*For details about the drive error code, refer to the Service Manual for the specific RAM Drive.</p> <p>*Details are described in “ 8. Service Explorer ”.</p>	<p>mm: Minute ss: Second</p> <p>3. Last Drive Error (1/2) is displayed for 5 seconds.</p> <p>*****</p> <p>4. Last Drive Error (2/2) is displayed for 5 seconds.</p> <p>*****</p> <p>5. Error occurring Disc type is displayed for 5 seconds.</p> <p>MEDIA *****</p> <p>6. Disc Maker ID is displayed for 5 seconds.</p> <p>*****</p> <p>7. Factor of Drive Error occurring is left displayed</p> <p>INFO*****</p>	<p>Press [4] [2] in service mode.</p> <p>When “INFO*****” is being displayed, past 19 error histories can be displayed by pressing [0] [1] - [1] [9]</p> <p>In case that the maker cannot be identified, display is black out.</p>
Delete the Last Drive Error	Delete the Last Drive Error information stored on the DVD RAM-Drive.	CLR DRIVE	Press [9] [6] in service mode.
Turn on all FL/LEDs	All segments of FL and all LEDs are turned on.	All segments are turned on.	Press [5] [1] in service mode.
PB HIGH Signal Output	8 pin of AV 1 Jack (PB HIGH terminal) is High (approx. 11V DC).	PB8 HIGH	Press [5] [2] in service mode.
PB MIDDLE Signal Output	8 pin of AV 1 Jack (PB HIGH terminal) is Middle (approx. 5.5V DC).	PB8 MIDDLE	Press [5] [3] in service mode.
Front connection inspection	Press all front keys and check the connection between Main P.C.B. and Front key Switches.	 <p>(1) Each time a key is pressed, segment turned on increases one by one.</p> <p>(2) Total number of keys that have been pressed.</p>	Press [5] [4] in service mode.
Production Date Display	Display the date when the unit was produced.	<p>PD YYYYMMDD</p> <p>YYYY: Year MM: Month DD: Day</p>	Press [6] [1] in service mode.
Display the accumulated working time	Display the accumulated unit's working time.	<p>***** S</p> <p>(Indicating unit: Second)</p>	Press [6] [4] in service mode.
Display the Error History	Display the Error History stored on the unit.	<p>Display reason of error for 5 seconds.</p> <p>FTREC***</p> <p>Display the time when the error has occurred for 5 seconds..</p> <p>YYMMDDHHMM</p> <p>YY: Year MM: Month DD: Day HH: Hour MM: Minute</p> <p>Accumulated working time till occurring of the error is left</p>	<p>Press [6] [5] in service mode.</p> <p>Then press [0] [1] ~ [1] [9], the past 19 error histories are displayed.</p>

		displayed. ***** S (Indicating unit: Second)	
Delete the Error History	Delete Error History information stored on the unit.	CLR FTREC	Press [9] [7] in service mode.
SD card WRITE check	Check SD card WRITE function with SD card slot.	<p>When the WRITE check is OK. SDCD OK</p> <p>When the WRITE check is NG. SDCD NG</p> <p>*Note: The image stored in the SD card will be erased.</p>	<p>Insert a SD card to SD card slot, and press [7] [4] in service mode.</p> <p>*Insert SD card while the power is off.</p> <p>*Check for [CARD SD] display on the FL display and go on the procedure.</p>
AV4(V) / AV1 (RGB) I/O Setting	Set input to AV4 (V) and set output to AV1 (RGB) for I/O checking	AV4V-AV1RGB	Press [8] [0] in service mode.
AV2(Y/C) / AV1 (V) I/O Setting	Set input to AV2 (Y/C) and set output to AV1 (V) for I/O checking	AV2YC-AV1V	Press [8] [1] in service mode.
AV2(V) / AV1 (Y/C) I/O Setting	Set input to AV2 (V) and set output to AV1 (Y/C) for I/O checking	AV2V-AV1 YC	Press [8] [2] in service mode.
AV2(RGB) / AV1 (V) I/O Setting	Set input to AV2(RGB) and set output to AV1(V) for I/O checking	AV2RGB-AV1V	Press [8] [3] in service mode.
P50(H) Output	Timer Microprocessor IC7501-83 output High signal for AV1-pin 10 passing through inverter (approx. 0V DC at AV1-pin 10).	<p>P50 HIGHOUT</p> <p>When OK. P50 HIGH OK</p> <p>When NG. P50 HIGH NG</p>	Press [8] [4] in service mode.
P50(L) Output	Timer Microprocessor IC7501-83 output Low signal for AV1-pin 10 passing through inverter (approx. 4.4V DC at AV1-pin 10).	<p>P50 LOW OUT</p> <p>When OK. P50 LOW OK</p> <p>When NG. P50 LOW NG</p>	Press [8] [5] in service mode.
Tray OPEN/CLOSE Test	The RAM drive tray is opened and closed repeatedly.	<p>NO*****</p> <p>“*” is number of open/close cycle times.</p>	<p>Press [9] [1] in service mode</p> <p>*When releasing this mode, press the [POWER] button of Remote Controller more than 10 seconds.</p>
Error code initialization	Initialization of the last error code held by timer (Write in F00)	CLR E-CODE	Press [9] [8] in service mode.
Initialize Service	Last Drive Error, Error history and Error Codes stored on the unit are initialized to factory setting.	CLR SERV	Press [9] [9] in service mode.
Finishing service mode	Release Service Mode.	<p>Display in STOP (E-E) mode.</p> <p>*****</p>	Press power button on the front panel or Remote controller in service mode.

10 Assembling and Disassembling

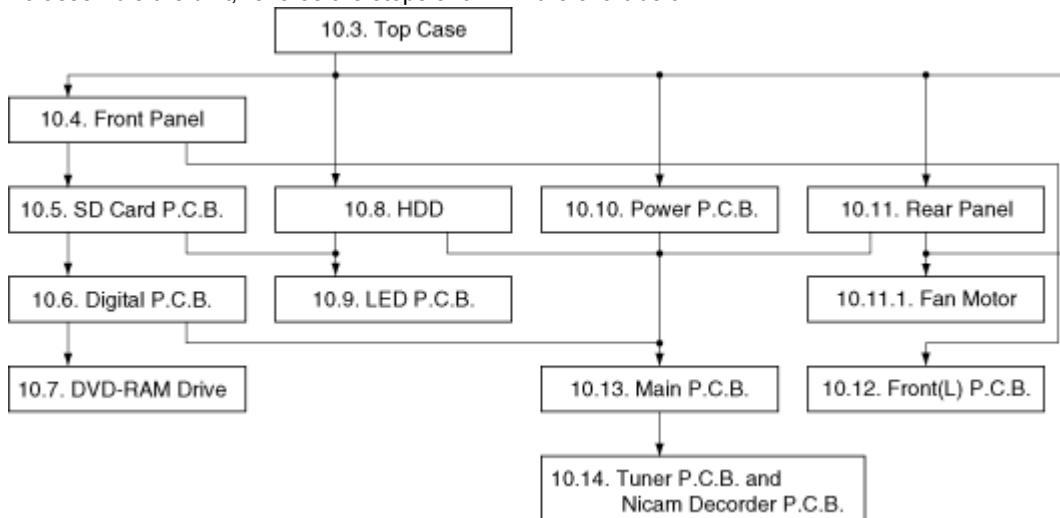
Caution:

Original screws should be used.

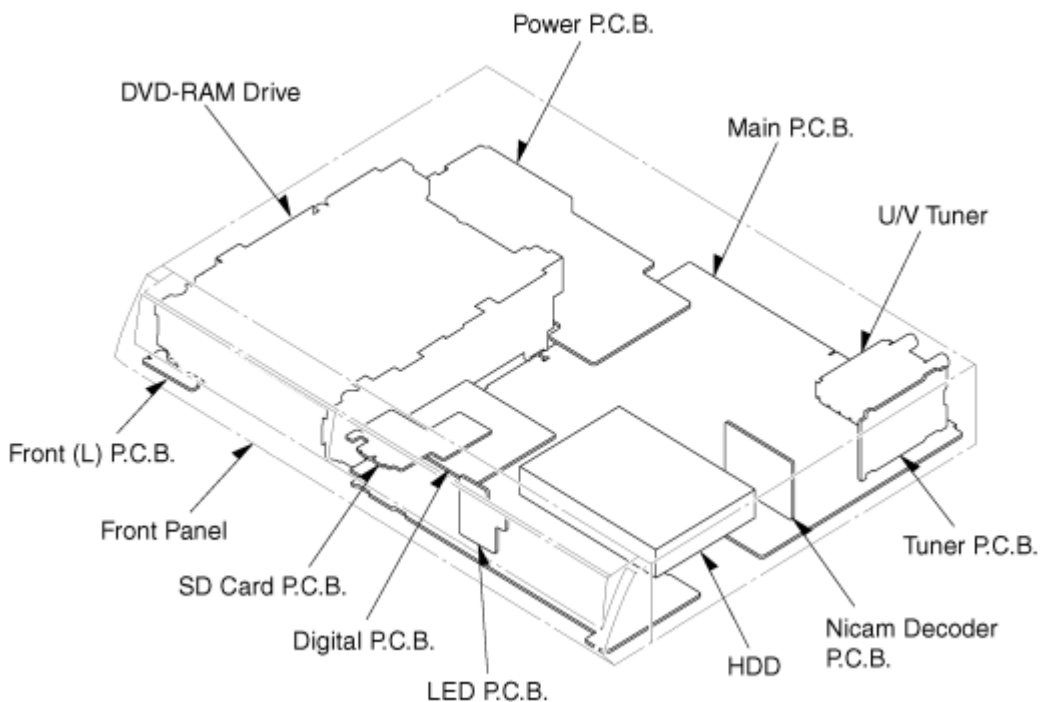
10.1 Disassembly Flow Chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.

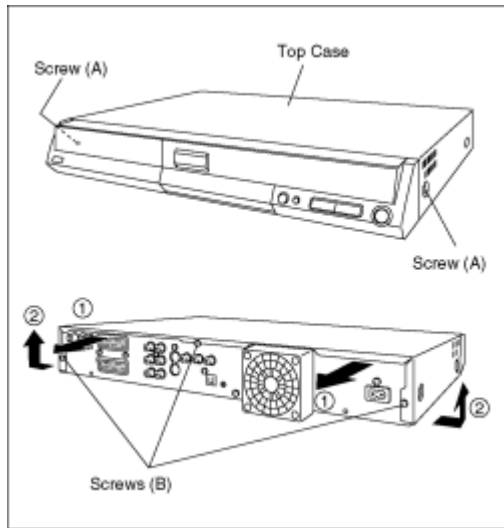


10.2 P.C.B. Positions



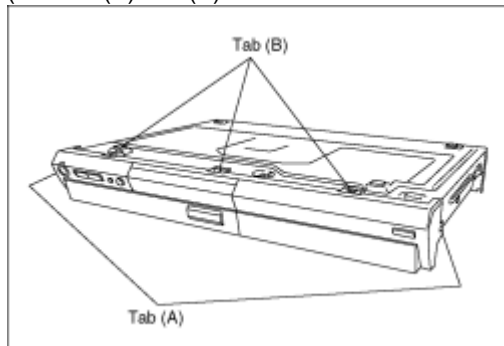
10.3 Top Case

1. Remove the 2 screws (A) and 3 screws (B).
2. Slide Top Case rearward and open the both ends at rear side of the Top Case a little and lift the Top Case in the direction of the arrows.



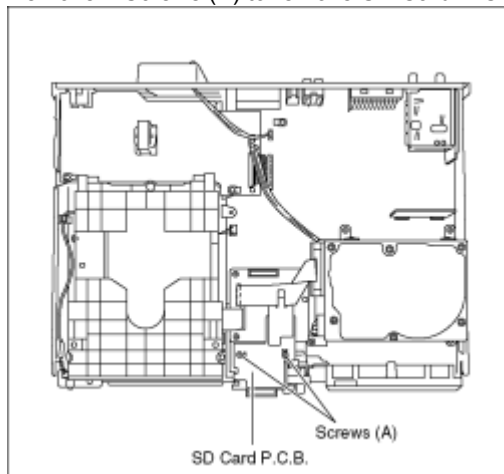
10.4 Front Panel

1. Unlock 2 tabs (A) and 3 tabs (B) in this order to remove Front Panel.
(The tab (A) and (B) should be unlocked at the same time, respectively.)



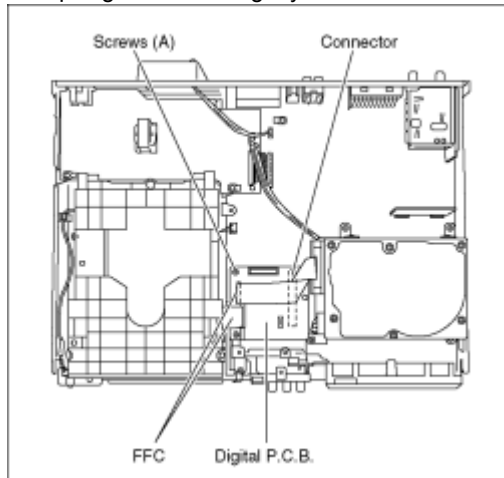
10.5 SD Card P.C.B.

1. Remove 2 Screws (A) to remove SD Card P.C.B.



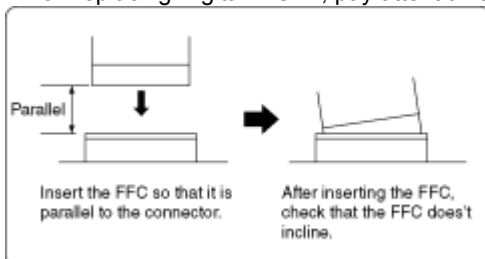
10.6 Digital P.C.B.

1. Remove 2FFCs and 2 Screws (A).
2. Lift up Digital P.C.B. slightly so to disconnect Connector to remove Digital P.C.B.



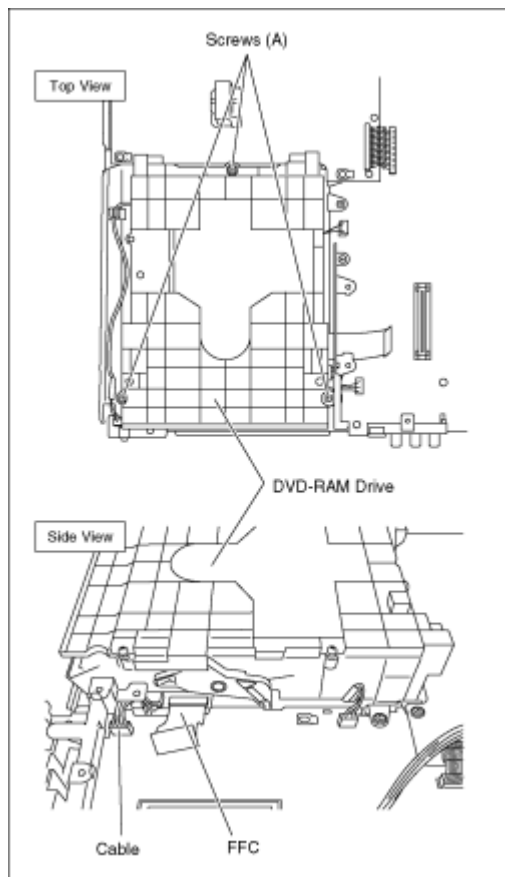
CAUTION:

When replacing Digital P.C.B., pay attention as below.



10.7 DVD-RAM Drive

1. Remove 3 Screws (A) to remove DVD-RAM Drive.
2. Lift up DVD-RAM Drive slightly and remove FFC and remove Cable between DVD-RAM Drive and Main P.C.B.



10.8 HDD

When replacing with Digital P.C.B., "UNFORMAT" indication is displayed and HDD must be formatted.

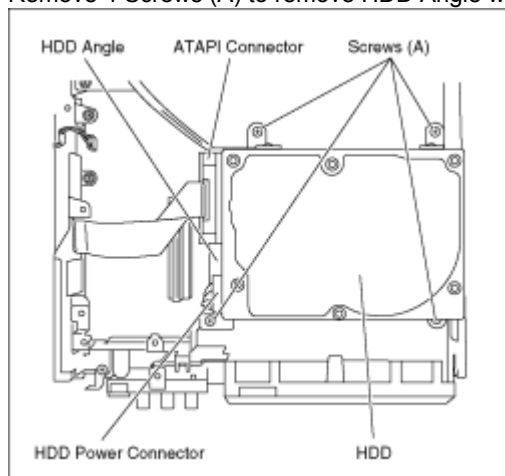
After that, programme in the HDD will be lost.

- How to format the HDD -

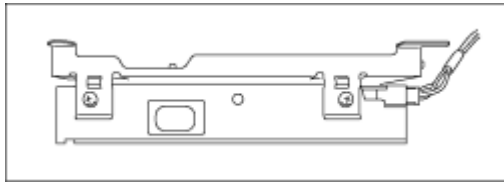
1) After "UNFORMAT" is displayed on the FL display, warning message for HDD format is appeared on the TV screen.

2) Select "YES" and press "ENTER" button on the remote controller, HDD will be formatted automatically.

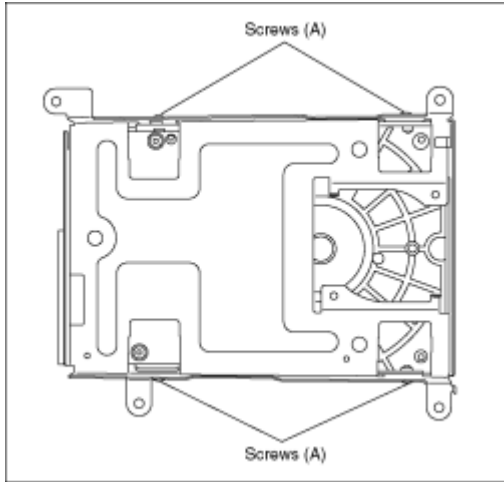
1. Remove ATAPI Connector and HDD Power Connector.
2. Remove 4 Screws (A) to remove HDD Angle with HDD.



3. Put HDD with HDD Angle up and down inversely so as not to give a shock to HDD.

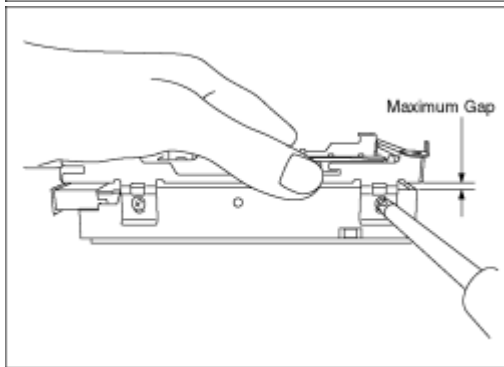


4. Remove 4 screws to remove HDD.



Caution for Attaching HDD

Put HDD up and down inversely so as not to give a shock to HDD, and put HDD Angle on to HDD and tighten 4 screws while lifting HDD Angle so as to keep maximum gap between HDD and HDD Angle.



Handling of HDD

The following precautions should be taken when handling HDD.

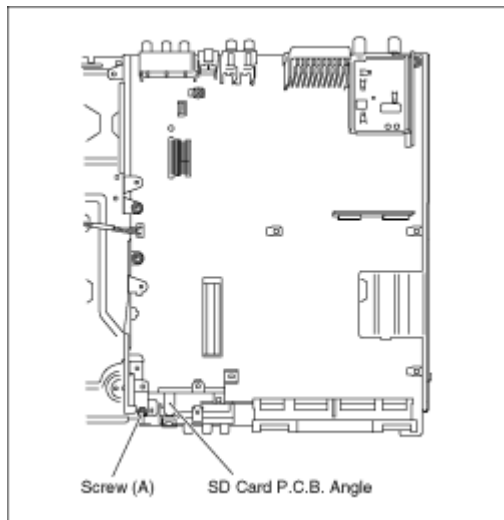
1. Never give an impact to HDD. (Even a drop from 1cm height can be a cause of HDD failure.)
2. When placing HDD on a workbench, provide a mat on a bench for shock absorption and anti-static purposes.
3. When installing HDD, release it from your hands only after confirming that it is fully set on the chassis.
4. Avoid stacking up HDD.
5. HDD is unstable and easy to fall. Do not stand it on its side face.
6. When handling HDD, hold its side faces to avoid static hazard.
7. Do not place HDD on its wrapping bag after removal. (Prevention of static hazard)
8. Use a screwdriver with low impact and anti-static features.

Note:

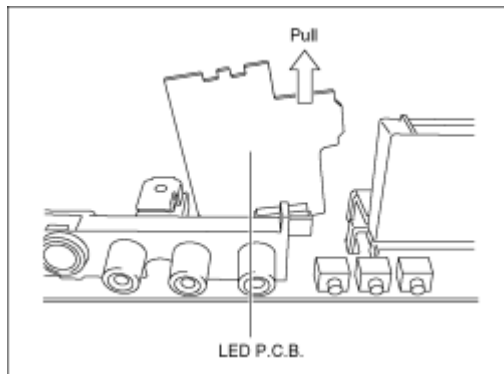
When replacing HDD, please make the rear jumper slave or cable select configuration.

10.9 LED P.C.B.

1. Remove a Screw (A) to remove SD Card P.C.B. Angle.

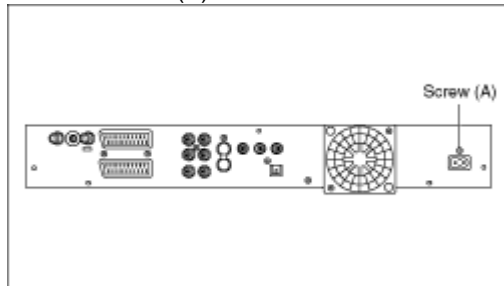


2. At first disconnect the connector on one side as shown below, and pull out LED P.C.B.

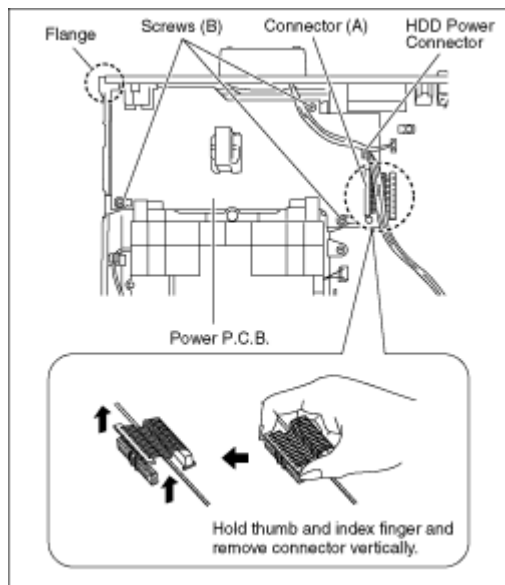


10.10 Power P.C.B.

1. Remove Screw (A).

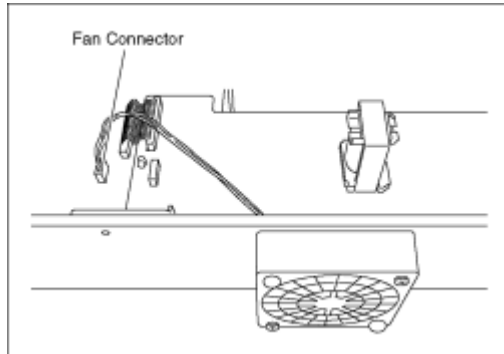


2. Remove 3 Screws (B) and disconnect Connector (A) and HDD Power Connector.
3. Unlock Power P.C.B. from a Flange to remove Power P.C.B.

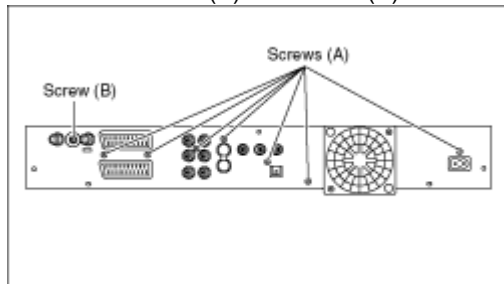


10.11 Rear Panel

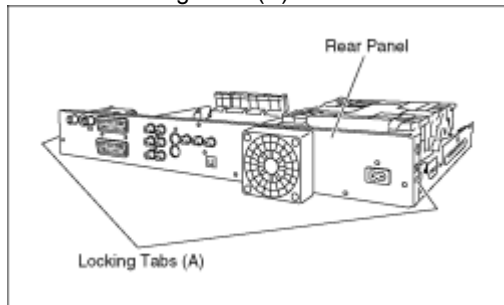
1. Disconnect Fan Connector.



2. Remove 7 Screws (A) and Screw (B).

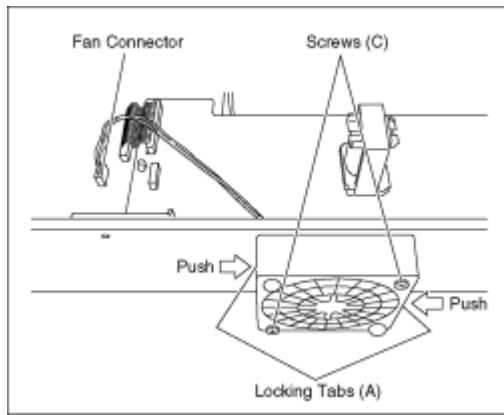


3. Unlock 2 Locking Tabs (A) to remove Rear Panel.



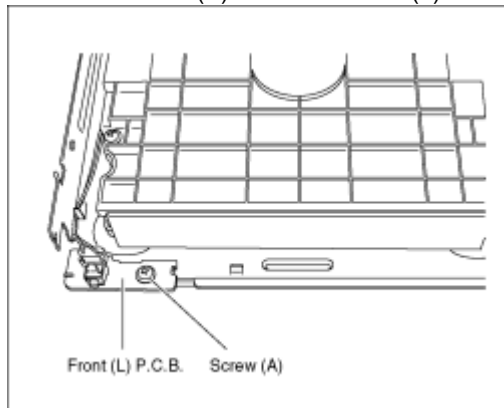
10.11.1 Fan Motor

1. Disconnect Fan Connector and remove 2 Screws (C).
2. Push and unlock 2 locking Tabs (A) to remove Fan Motor.



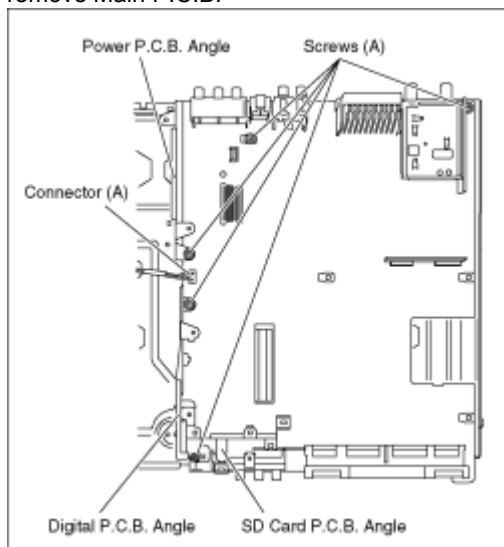
10.12 Front (L) P.C.B.

1. Remove a Screw (A) to remove Front (L) P.C.B.



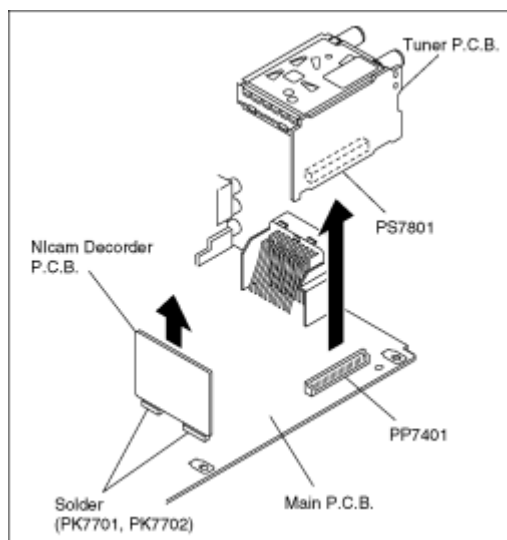
10.13 Main P.C.B.

1. Disconnect Connector (A) for Front (L) P.C.B.
2. Remove 5 Screws (A),.
3. Remove Power P.C.B. Angle, Digital P.C.B. Angle and SD Card P.C.B. Angle and disconnect Connector (A) to remove Main P.C.B.



10.14 Tuner P.C.B. and Nicam Decoder P.C.B.

1. Pull out the Tuner P.C.B. in the direction of the arrow.
2. Remove the solders and pull out the Nicam Decoder P.C.B.



11 Service Fixture and Tools

Part Number	Description	Compatibility
RFKZ0125	Extension FFC (Digital P.C.B. - DVD-RAM Drive / 40 Pin)	Same as E50/ E55 series
RFKZ0126	Extension Cable (MainP.C.B. - DVD-RAM Drive/ 4 Pin)	Same as E30/HS2 series
RFKZ0216	Extension Cable (MainP.C.B. - Power P.C.B. / 23 Pin)	Same as E55 series
RFKZ0260	Extension Cable (MainP.C.B. - Digital P.C.B. / 88 Pin)	New

12 Service Positions

Note:

For description of the disassembling procedure, see the section 10.

12.1 Checking and Repairing of Power P.C.B.

1. Top Case

Remove 2 Screws (A) on side

Remove 3 rear Screws (B) on rear

Remove Top Case

2. Power P.C.B.

Remove 1 Screw for AC Inlet fixing

Remove 3 Screws fixing Power P.C.B.

Remove Connector (A) to Main P.C.B.

Unlock Power P.C.B. from a Flange to remove Power P.C.B.

Connect Extension Cable between Main P.C.B. and Power P.C.B. (RFKZ0216).

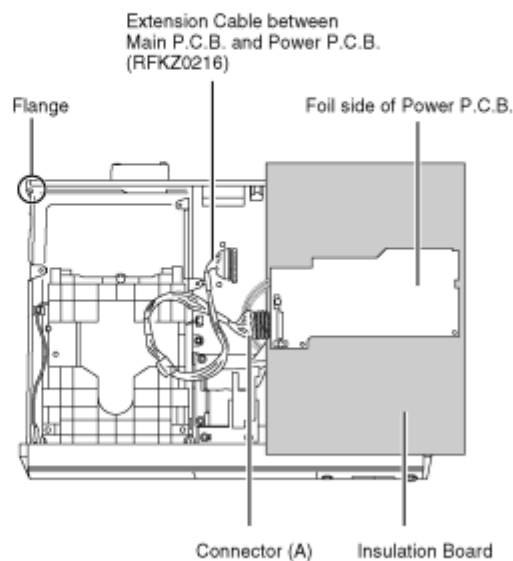
Put Power P.C.B. on Insulation Board so that it's foil side faces top.

Caution 1:

Red wire in the extension cable should be connected to (1) pin.

Caution 2:

Original screws should be used.



12.2 Checking and Repairing of Digital P.C.B.

1. Top Case

Remove 2 Screws (A) on side

Remove 3 rear Screws (B) on rear

Remove Top Case

2. Front Panel

Unlock 2 Locking Tabs on side

Unlock 3 Locking Tabs on bottom

Remove Front Panel

3. SD Card P.C.B.

Remove 2 Screws

Remove SD Card P.C.B.

4. Digital P.C.B.

Remove FFC from Digital P.C.B. for RAM

Remove 2 Screws fixing Digital P.C.B.

Lift up Digital P.C.B. Slightly to remove it

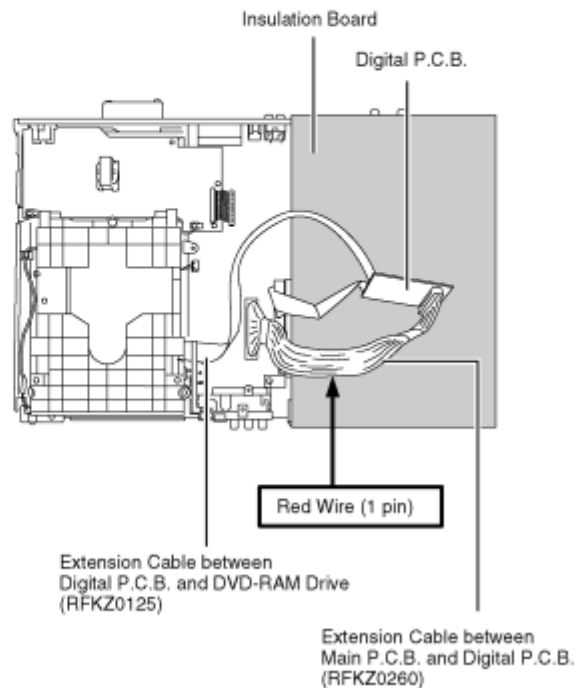
Remove 3 Screws fixing RAM Drive. While lifting up DVD-RAM Drive slightly, remove FFC and connect Extension Cables between DVD-RAM Drive and Digital P.C.B. (RFKZ0125). Connect Extension Cable between Main P.C.B. and Digital P.C.B. (RFKZ0260).

Caution 1:

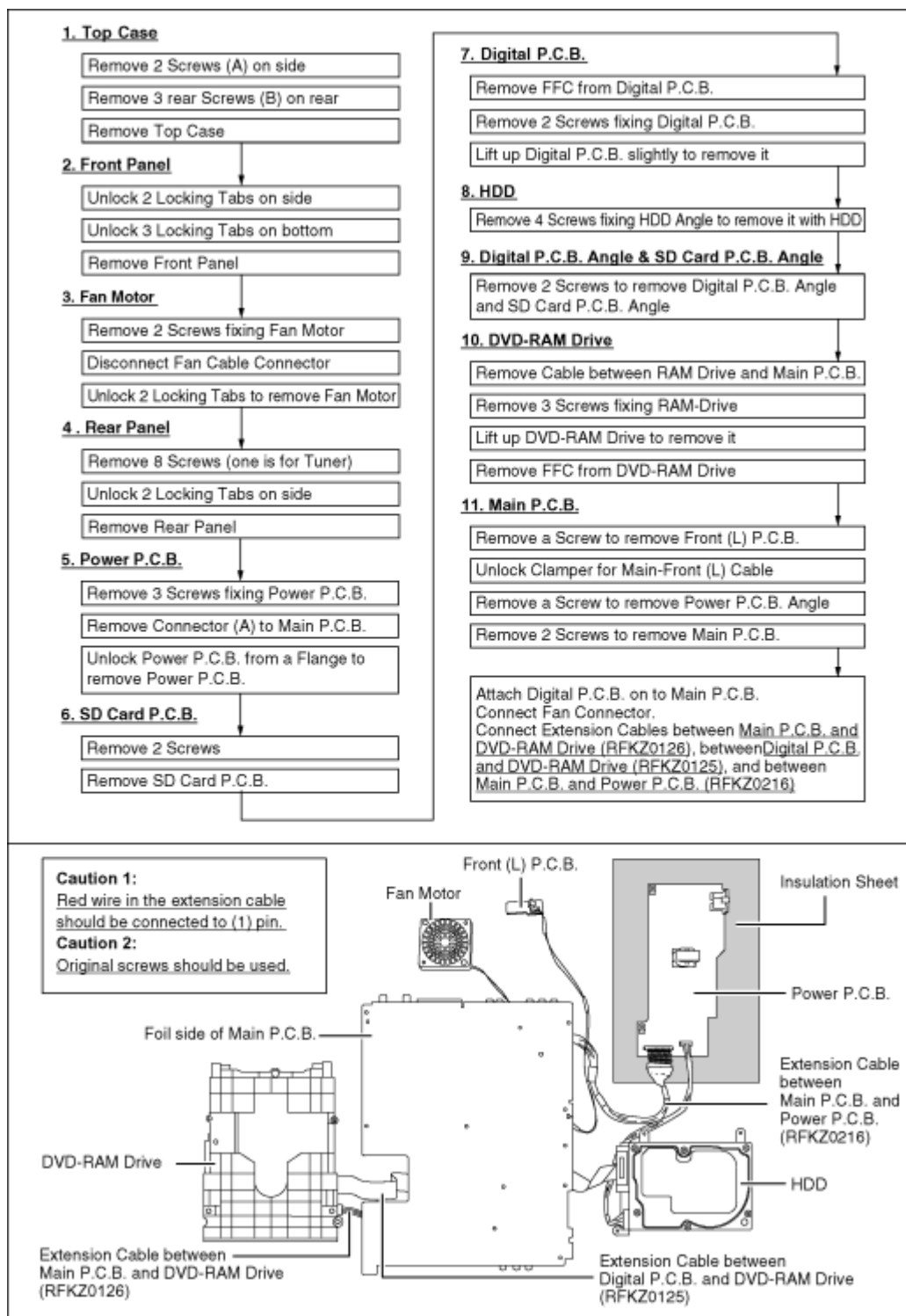
Red wire in the extension cable should be connected to (1) pin.

Caution 2:

Original screws should be used.



12.3 Checking and Repairing of Main P.C.B.



12.4 Checking and Repairing of DVD-RAM Drive

1. Top Case

Remove 2 Screws (A) on side

Remove 3 rear Screws (B) on rear

Remove Top Case

2. Front Panel

Unlock 2 Locking Tabs on side

Unlock 3 Locking Tabs on bottom

Remove Front Panel

3. SD Card P.C.B.

Remove 2 Screws

Remove SD Card P.C.B.

4. Digital P.C.B.

Remove FFC from Digital P.C.B. for DVD-RAM Drive

Remove 2 Screw fixing Digital P.C.B.

Lift up Digital P.C.B. slightly to remove it

5. DVD-RAM Drive

Remove 3 Screws fixing RAM Drive

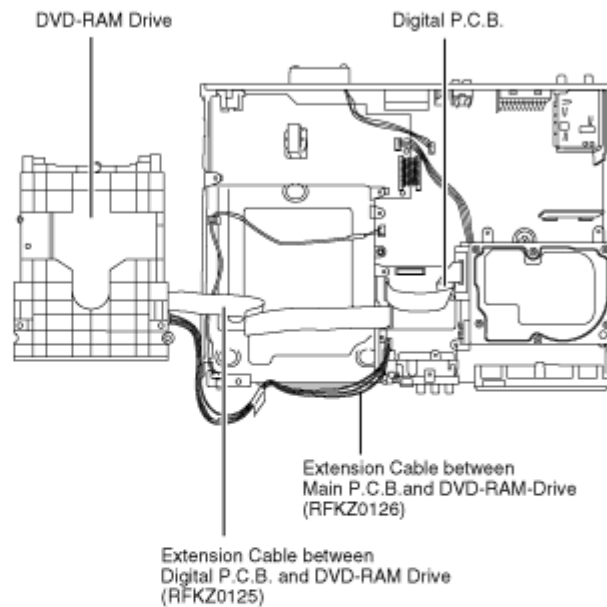
Lift up DVD-RAM Drive slightly and remove FFC from DVD-RAM Drive and remove Cable between DVD-RAM Drive and Main P.C.B.

Attach Digital P.C.B.

Put DVD-RAM Drive on side.

Connect Extension Cables between Main P.C.B. and DVD-RAM Drive, (RFKZ0126), and between Digital P.C.B. and DVD-RAM Drive (RFKZ0125).

Caution :
Original screws should be used.



12.5 Checking and Repairing of HDD

1. Top Case

Remove 2 Screws (A) on side

Remove 3 Screws (B) on rear

Remove Top Case

2. HDD

Disconnect HDD ATAPI Connector

Remove 4Pin Power Cable from HDD

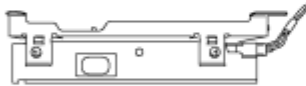
Connect HDD ATAPI Connector to Replacement HDD

Connect 4Pin Power Cable to Replacement HDD

Put Replacement HDD on Insulation Board

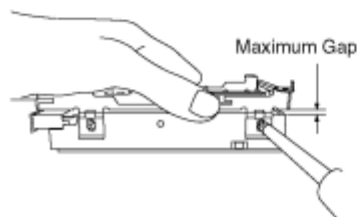
Caution for Removing HDD

Put HDD with HDD Angle up and down inversely and remove 4 screws to remove HDD so as not to give a shock to HDD.



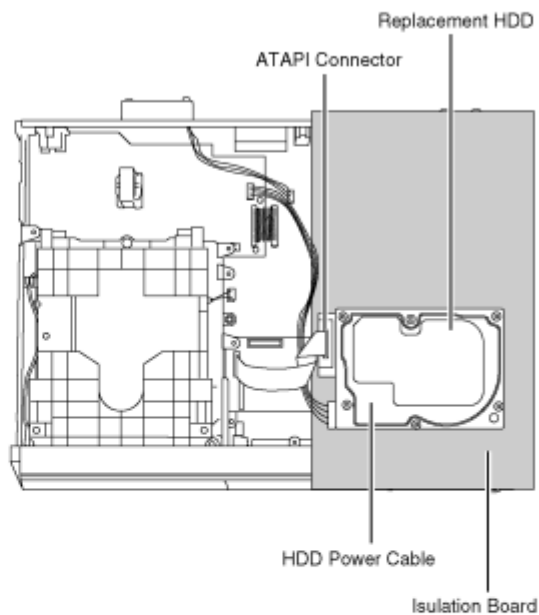
Caution for Attaching HDD

Put HDD up and down inversely, and put HDD Angle on to HDD and tighten 4 screws while lifting HDD Angle so as to keep maximum gap between HDD and HDD Angle.



Caution :

Original screws should be used.



13 Caution after replacing parts

13.1 After replacing the RAM Drive with new one

After replacing RAM drive unit, TEST mode is not necessary. Please confirm operation for RAM drive

13.2 When the unit does not operate normally after replacing the Timer Microprocessor or Main P.C.B.

When the unit does not operate normally after replacing the Timer Microprocessor or Main P.C.B. with new one, reset Timer Microprocessor.

Step	Operation	Descriptions
1	While power is ON, short IC7502-4 pin (RESET) and the GND momentarily.	"RESET (L)" is transmitted to the XRESET of Timer Microprocessor (IC7501-11 pin), then the unit operates normally.

14 Standard Inspection Specifications after Making Repairs

After making repairs, we recommend performing the following inspection, to check normal operation.

No.	Procedure	Item to Check
1	Turn on the power, and confirm items pointed out.	Items pointed out should reappear.
2	Insert RAM disc.	The Panasonic RAM disc should be recognized.
3	Enter the EE (TU IN / AV IN - AV OUT) mode.	No abnormality should be seen in the picture, sound or operation.
4	Perform auto recording and playback for one minute using the RAM disc.	No abnormality should be seen in the picture, sound or operation. *Panasonic DVD-RAM disc should be used when recording and playback.
5	Model with the HDD: Perform auto recording and playback for one minute using the HDD.	No abnormality should be seen in the picture, sound or operation.
6	If a problem is caused by a VCD, DVD-R, DVD-Video, Audio-CD, or MP3, playback the test disc.	No abnormality should be seen in the picture, sound or operation.
7	Models with SD Card Slot or DV Input Jack: In case of that the trouble is caused by SD card and/or DV terminal.	Models with SD Card Slot or DV Input Jack; 1) SD card: Check to be able to display and copy the picture. 2) DV terminal: Check to be able to record from DVC.
8	After checking and making repairs, upgrade the firmware to the latest version.	Make sure that [FIRM_SUCCESS] appears in the FL displays. *[UNSUPPORT] display means the unit is already updated to newest same version. Then version up is not necessary.
9	Transfer [9][9] in the service mode setting, and initialize the service settings (return various settings and error information to their default values. The laser time is not included in this initialization).	Make sure that [CLR SERV] appears in the FL display. After checking it, turn the power off.
10	When replacing of RAM drive, transfer [9] [5] in the service mode setting to delete Laser used time.	Make sure that [CLR LASER] appears in the FL display. After that, turn power off.

Use the following checklist to establish the judgement criteria for the picture and sound.

Item	Contents	Check	Item	Contents	Check
Picture	Block noise		Sound	Distorted sound	
	Crosscut noise			Noise (static, background noise, etc.)	
	Dot noise			The sound level is too low.	
	Picture disruption			The sound level is too high.	
	Not bright enough			The sound level changes.	
	Too bright				
	Flickering color				
	Color fading				

15 Voltage and Waveform Chart

Note)

Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

15.1 Power P.C.B.



15.2 Main P.C.B.



15.3 Tuner P.C.B.



15.4 LED P.C.B.



15.5 P9001 Connector



15.6 Waveform Chart



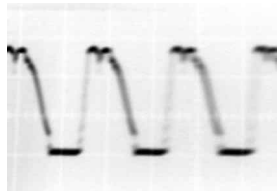
[illegible]

Ref No.	IC3001																							
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100				
REC	2.1	5.0	1.5	5.1	2.1	4.5	3.6	4.8	4.6	5.0	2.0	2.8	2.1	5.1	2.0	0	2.1	0	2.0	2.5				
PLAY	2.1	5.0	1.5	5.1	2.1	4.5	3.6	4.8	4.6	5.0	2.0	2.8	2.1	5.1	2.0	0	2.1	0	2.0	2.5				
STOP	4.7	5.0	1.5	5.1	2.1	4.5	3.6	4.8	4.6	5.1	5.0	2.8	2.1	5.1	2.0	0	2.1	0	2.0	2.5				
Ref No.	IC4009								IC4011															
MODE	1	2	3	4	5	6	7	8									1	2	3	4	5			
REC	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6									1.3	0	4.9	5.7	5.0			
PLAY	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6									1.3	0	4.9	5.7	5.0			
STOP	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6									1.3	0	4.9	5.7	5.0			
Ref No.	IC4012								IC7401															
MODE	1	2	3	4	5	6	7	8									1	2	3	4	5			
REC	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6									12.3	4.2	11.6	2.6	0			
PLAY	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6									12.3	4.2	11.6	2.6	0			
STOP	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6									12.3	4.2	11.6	2.6	0			
Ref No.	IC7402								IC7403															
MODE	1	2	3	4	5	6		1	2	3	4	5	6	7	8									
REC	5.6	0	5.6	1.3	0	5.1		5.0	0	0	2.7	4.1	0.3	0.4	5.6									
PLAY	5.6	0	5.6	1.3	0	5.1		5.0	0	0	2.7	4.1	0.3	0.4	5.6									
STOP	5.6	0	5.6	1.3	0	5.1		5.0	0	0	3.4	4.2	3.8	0	5.6									
Ref No.	IC7501																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
REC	0.3	4.9	3.8	0.8	0.8	4.4	0	0	0.7	1.2	5.0	1.4	0	2.1	3.3	4.9	3.3	3.2	3.2	3.1				
PLAY	0.3	4.9	3.8	0.8	0.8	4.4	0	0	0.7	1.2	5.0	1.4	0	2.1	3.3	4.9	3.3	3.2	3.2	3.1				
STOP	0.6	4.9	4.5	0.9	0.9	4.4	0	0	0.7	1.2	5.0	1.4	0	2.1	3.3	4.9	3.3	3.2	3.2	3.1				
Ref No.	IC7501																							
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40				
REC	0	0	0	3.3	0	0	0	0	4.6	0	0.9	1.6	1.2	5.0	2.6	0	0	0.1	3.3	3.3				
PLAY	0	0	0	3.3	0	0	0	0	4.6	0	0.9	1.6	1.2	5.0	2.6	0	0	0.1	3.3	3.3				
STOP	0	0	0	3.3	0	0	0	4.8	4.6	0	0.9	1.6	1.2	5.0	2.6	0	0	0.1	3.3	3.3				
Ref No.	IC7501																							
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60				
REC	0	3.3	3.2	3.3	0	0	5.0	0	4.9	4.9	4.9	0	4.9	5.1	5.0	0	0	0	0	4.9				
PLAY	0	3.3	3.2	3.3	0	0	5.0	0	4.9	4.9	4.9	0	4.9	5.1	5.0	0	0	0	0	4.9				
STOP	0	3.3	3.2	3.3	0	0	5.0	4.9	4.9	4.9	4.9	0	4.9	5.1	5.0	0	0	0	0	4.9				
Ref No.	IC7501																							
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80				
REC	0	4.9	4.9	0	0	0	0	0	5.0	0	0	0	0	0	0	0	4.9	0	0	4.1				
PLAY	0	4.9	4.9	0	0	0	0	0	5.0	0	0	0	0	0	0	0	4.9	0	0	4.1				
STOP	0	4.9	4.9	0	0	0	0	0	5.0	0	0	0	0	0	0	0	4.9	0	0	4.1				
Ref No.	IC7501																							
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100				
REC	0	5.0	0	0	0	0	4.9	0	0	0	0	0	4.9	0	5.0	4.9	0.6	2.3	4.7	3.2				
PLAY	0	5.0	0	0	0	0	4.9	0	0	0	0	0	4.9	0	5.0	4.9	0.6	2.3	4.7	3.2				
STOP	0	5.0	0	0	0	0	4.9	0	0	0	0	0	4.9	0	4.9	2.5	2.1	0.3	4.7	0				
Ref No.	IC7501																							
MODE	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116								
REC	4.9	5.0	0	5.0	5.0	5.0	5.0	5.0	5.0	1.3	0	5.0	2.0	0	0	0.5								
PLAY	4.9	5.0	0	5.0	5.0	5.0	5.0	5.0	5.0	1.3	0	5.0	2.0	0	0	0.5								
STOP	5.0	5.0	0	5.0	5.0	5.0	5.0	5.0	5.0	1.3	0	5.0	2.0	0	0	1.0								
Ref No.	IC7502								IC7503															
MODE	1	2	3	4	5			1	2	3	4	5	6	7	8									
REC	0	0	0	5.0	5.0			0	0	0	0	4.6	4.8	4.9	5.0									
PLAY	0	0	0	5.0	5.0			0	0	0	0	4.6	4.8	4.9	5.0									
STOP	0	0	0	5.0	5.0			0	0	0	0	4.6	4.7	4.9	5.0									
Ref No.	IC7504																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
REC	4.9	0	4.4	2.5	0	2.2	2.2	5.0	-27.8	-25.8	-25.7	-26.5	-25.6	-25.1	-24.7	-27.8	-24.7	5.0	-24.7	-21.6				
PLAY	4.9	0	4.4	2.5	0	2.2	2.2	5.0	-27.8	-25.8	-25.7	-26.5	-25.6	-25.1	-24.7	-27.8	-24.7	5.0	-24.7	-21.6				
STOP	4.9	0	4.4	0.8	0	2.2	2.2	5.0	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-18.0	5.0	-15.5	-18.0				
Ref No.	IC7504																							
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40				
REC	-18.5	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-21.5	-21.5	-18.4	-21.6	-21.6	-13.3	-15.6	-9.8	-18.5	-21.6	-18.5	-11.7	-21.3				
PLAY	-18.5	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-21.5	-21.5	-18.4	-21.6	-21.6	-13.3	-15.6	-9.8	-18.5	-21.6	-18.5	-11.7	-21.3				
STOP	-13.0	-18.0	-15.5	-18.2	-18.4	-18.0	-18.1	-18.1	-10.5	-13.4	-18.5	-16.5	-15.1	-16.0	-3.9	-17.8	-10.1	-12.2	-12.2	-14.2				
Ref No.	IC7504																							
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60				
REC	-21.6	-21.7	-21.9	-22.4	-19.3	-13.6	-16.2	-21.9	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-24.7	-24.7	-24.7	-24.7	-24.7				
PLAY	-21.6	-21.7	-21.9	-22.4	-19.3	-13.6	-16.2	-21.9	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-24.7	-24.7	-24.7	-24.7	-24.7				
STOP	-16.5	-17.2	-17.2	-16.6	-14.2	-14.3	-14.7	-27.8	-27.8	-27.3	-27.8	-27.0	-26.5	-26.5	-26.5	-25.0	-23.6	-24.5	-23.6	-23.0				
Ref No.	IC7504																							
MODE	61	62	63	64																				
REC	-24.7	-24.7	-24.7	-28.0																				
PLAY	-24.7	-24.7	-24.7	-28.0																				
STOP	-22.5	-22.5	-22.4	-28.0																				
Ref No.	IC7505								IC7506								IC7507							
MODE	1	2	3	4	5			1	2	3	4	5			1	2	3	4	5	6				
REC	4.1	5.2	0	0	0			2.2	3.3	0	0	0			5.7	1.3	1.3	0	0.2	0.3				
PLAY	4.1	5.2	0	0	0			2.2	3.3	0	0	0			5.7	1.3	1.3	0	0.2	0.3				
STOP	4.1	5.2	0	0	0			2.2	3.3	0	0	0			5.7	1.3	1.3	0	0.3	0.2				
Ref No.	Q4004				Q4006				Q4007				Q4008				Q4009							
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B					
REC	5.2	-0.9	5.2		0	0	-0.1		0	0	-0.1		0	0	-0.2		0	0	-0.2					
PLAY	5.2	-0.9	5.2		0	0	-0.1		0	0	-0.1		0	0	-0.2		0	0	-0.2					
STOP	5.2	-0.4	5.2		0	0	-0.1		0	0	-0.1		0	0	0.4		0	0	0					

[illegible]

[illegible]

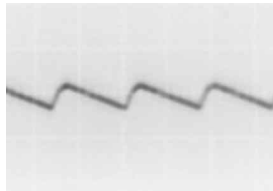
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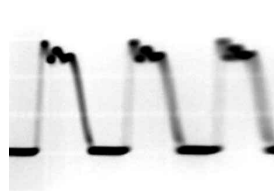
T1150-3 STOP
30Vp-p ($5\ \mu\text{sec.div}$)



T1150-5 STOP
560Vp-p ($5\ \mu\text{sec.div}$)



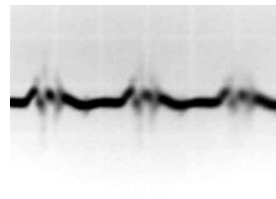
T1150-7 STOP
8Vp-p (5m sec.div)



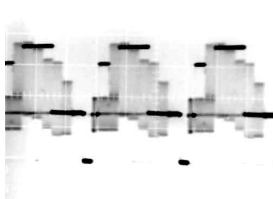
T1150-15,18 STOP
30Vp-p ($5\ \mu\text{sec.div}$)



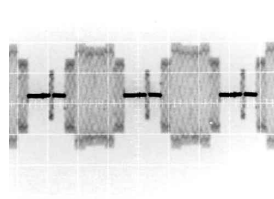
IC1150-1 STOP
8.0Vp-p ($5\ \mu\text{sec.div}$)



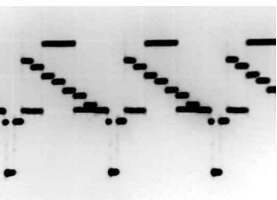
IC1150-2 STOP
0.5Vp-p ($5\ \mu\text{sec.div}$)



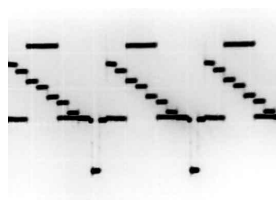
P7402-83 REC/PLAY
1.0Vp-p ($20\ \mu\text{sec.div}$)



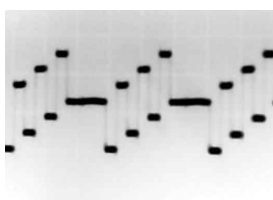
P7402-51 REC/PLAY
0.7Vp-p ($20\ \mu\text{sec.div}$)



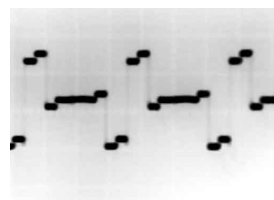
P7402-47 REC/PLAY
1.0Vp-p ($20\ \mu\text{sec.div}$)



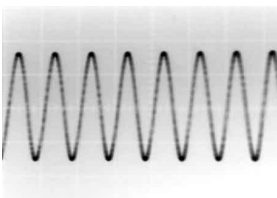
P7402-59 REC/PLAY
1.0Vp-p ($20\ \mu\text{sec.div}$)



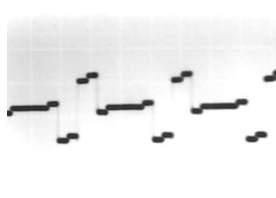
P7402-63 REC/PLAY
0.6Vp-p ($20\ \mu\text{sec.div}$)



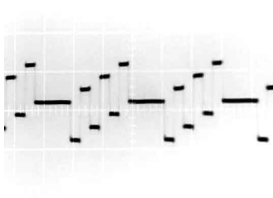
P7402-55 REC/PLAY
0.6Vp-p ($20\ \mu\text{sec.div}$)



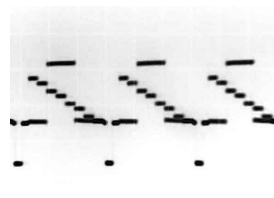
P7402-29,31 REC/PLAY
0.8Vp-p (1m sec.div)



JK3903-2 REC/PLAY
1.1Vp-p ($20\ \mu\text{sec.div}$)



JK3903-3 REC/PLAY
1.1Vp-p ($20\ \mu\text{sec.div}$)



JK3903-4 REC/PLAY
2.0Vp-p ($20\ \mu\text{sec.div}$)

16 Abbreviations

INITIAL/LOGO	ABBREVIATIONS
A	A0~UP ADDRESS ACLK AUDIO CLOCK AD0~UP ADDRESS BUS ADATA AUDIO PES PACKET DATA ALE ADDRESS LATCH ENABLE AMUTE AUDIO MUTE AREQ AUDIO PES PACKET REQUEST ARF AUDIO RF ASI SERVO AMP INVERTED INPUT ASO SERVO AMP OUTPUT ASYNC AUDIO WORD DISTINCTION SYNC
B	BCK BIT CLOCK (PCM) BCKIN BIT CLOCK INPUT BDO BLACK DROP OUT BLKCK SUB CODE BLOCK CLOCK BOTTOM CAP. FOR BOTTOM HOLD BYP BYPATH BYTCK BYTE CLOCK
C	CAV CONSTANT ANGULAR VELOCITY CBDO CAP. BLACK DROP OUT CD COMPACT DISC CDSCK CD SERIAL DATA CLOCK CDSRDATA CD SERIAL DATA CDRF CD RF (EFM) SIGNAL CDV COMPACT DISC-VIDEO CHNDATA CHANNEL DATA CKSL SYSTEM CLOCK SELECT CLV CONSTANT LINEAR VELOCITY COFTR CAP. OFF TRACK CPA CPU ADDRESS CPCS CPU CHIP SELECT CPDT CPU DATA CPUADR CPU ADDRESS LATCH CPUADT CPU ADDRESS DATA BUS CPUIRQ CPU INTERRUPT REQUEST CPRD CPU READ ENABLE CPWR CPU WRITE ENABLE CS CHIP SELECT CSYNCIN COMPOSITE SYNC IN CSYNCOUT COMPOSITE SYNC OUT
D	DACCK D/A CONVERTER CLOCK DEEMP DEEMPHASIS BIT ON/OFF DEMPH DEEMPHASIS SWITCHING DIG0~UP FL DIGIT OUTPUT DIN DATA INPUT DMSRCK DM SERIAL DATA READ CLOCK DMUTE DIGITAL MUTE CONTROL DO DROP OUT DOUT0~UP DATA OUTPUT DRF DATA SLICE RF (BIAS) DRPOUT DROP OUT SIGNAL DREQ DATA REQUEST DRESP DATA RESPONSE DSC DIGITAL SERVO CONTROLLER DSLFF DATA SLICE LOOP FILTER DVD DIGITAL VIDEO DISC
INITIAL/LOGO	ABBREVIATIONS
E	EC ERROR TORQUE CONTROL ECR ERROR TORQUE CONTROL REFERENCE ENCSEL ENCODER SELECT ETMCLK EXTERNAL M CLOCK (81MHz/40.5MHz)

	ETSCLK	EXTERNAL S CLOCK (54MHz)
F	FBAL FCLK FE FFI FEO FG FSC FSCK	FOCUS BALANCE FRAME CLOCK FOCUS ERROR FOCUS ERROR AMP INVERTED INPUT FOCUS ERROR AMP OUTPUT FREQUENCY GENERATOR FREQUENCY SUB CARRIER FS (384 OVER SAMPLING) CLOCK
G	GND	COMMON GROUNDING (EARTH)
H	HA0~UP HD0~UP HINT HRXW	HOST ADDRESS HOST DATA HOST INTERRUPT HOST READ/WRITE
I	IECOUT IPFRAG IREF ISEL	IEC958 FORMAT DATA OUTPUT INTERPOLATION FLAG I (CURRENT) REFERENCE INTERFACE MODE SELECT
L	LDON LPC LRCK	LASER DIODE CONTROL LASER POWER CONTROL L CH/R CH DISTINCTION CLOCK
M	MA0~UP MCK MCKI MCLK MDATA MDQ0~UP MDQM MLD MPEG	MEMORY ADDRESS MEMORY CLOCK MEMORY CLOCK INPUT MEMORY SERIAL COMMAND CLOCK MEMORY SERIAL COMMAND DATA MEMORY DATA INPUT/OUTPUT MEMORY DATA I/O MASK MEMORY SERIAL COMMAND LOAD MOVING PICTURE EXPERTS GROUP
O	ODC OFTR OSCI OSCO OSD	OPTICAL DISC CONTROLLER OFF TRACKING OSCILLATOR INPUT OSCILLATOR OUTPUT ON SCREEN DISPLAY
P	P1~UP PCD PCK PDVD PEAK PLLCLK PLLOK PWMCTL PWMDA PWMOA, B	PORT CD TRACKING PHASE DIFFERENCE PLL CLOCK DVD TRACKING PHASE DIFFERENCE CAP. FOR PEAK HOLD CHANNEL PLL CLOCK PLL LOCK PWM OUTPUT CONTROL PULSE WAVE MOTOR DRIVE A PULSE WAVE MOTOR OUT A, B

INITIAL/LOGO		ABBREVIATIONS
R	RE RFENV RFO RS RSEL RST RSV	READ ENABLE RF ENVELOPE RF PHASE DIFFERENCE OUTPUT (CD-ROM) REGISTER SELECT RF POLARITY SELECT RESET RESERVE
	SBI0, 1 SBO0 SBT0, 1 SCK SCKR SCL SCLK SDA SEG0~UP SELCLK SEN SIN1, 2 SOUT1, 2 SPDI SPDO	SERIAL DATA INPUT SERIAL DATA OUTPUT SERIAL CLOCK SERIAL DATA CLOCK AUDIO SERIAL CLOCK RECEIVER SERIAL CLOCK SERIAL CLOCK SERIAL DATA FL SEGMENT OUTPUT SELECT CLOCK SERIAL PORT ENABLE SERIAL DATA IN SERIAL DATA OUT SERIAL PORT DATA INPUT SERIAL PORT DATA OUTPUT

S	SPEN	SERIAL PORT R/W ENABLE
	SPRCLK	SERIAL PORT READ CLOCK
	SPWCLK	SERIAL PORT WRITE CLOCK
	SQCK	SUB CODE Q CLOCK
	SQCX	SUB CODE Q DATA READ CLOCK
	SRDATA	SERIAL DATA
	SRMADR	SRAM ADDRESS BUS
	SRMDT0~7	SRAM DATA BUS 0~7
	SS	START/STOP
	STAT	STATUS
	STCLK	STREAM DATA CLOCK
	STD0~UP	STREAM DATA
	STENABLE	STREAM DATA INPUT ENABLE
	STSEL	STREAM DATA POLARITY SELECT
	STVALID	STREAM DATA VALIDITY
	SUBC	SUB CODE SERIAL
	SBCK	SUB CODE CLOCK
	SUBQ	SUB CODE Q DATA
	SYSCLK	SYSTEM CLOCK
T	TE	TRACKING ERROR
	TIBAL	BALANCE CONTROL
	TID	BALANCE OUTPUT 1
	TIN	BALANCE INPUT
	TIP	BALANCE INPUT
	TIS	BALANCE OUTPUT 2
	TPSN	OP AMP INPUT
	TPSO	OP AMP OUTPUT
	TPSP	OP AMP INVERTED INPUT
	TRCRS	TRACK CROSS SIGNAL
	TRON	TRACKING ON
	TRSON	TRAVERSE SERVO ON

INITIAL/LOGO		ABBREVIATIONS
V	VBLANK	V BLANKING
	VCC	COLLECTOR POWER SUPPLY VOLTAGE
	VCDCONT	VIDEO CD CONTROL (TRACKING BALANCE)
	VDD	DRAIN POWER SUPPLY VOLTAGE
	VFB	VIDEO FEED BACK
	VREF	VOLTAGE REFERENCE
	VSS	SOURCE POWER SUPPLY VOLTAGE
W	WAIT	BUS CYCLE WAIT
	WDCK	WORD CLOCK
	WEH	WRITE ENABLE HIGH
	WSR	WORD SELECT RECEIVER
X	X	X□ TAL
	XALE	X ADDRESS LATCH ENABLE
	XAREQ	X AUDIO DATA REQUEST
	XCDROM	X CD ROM CHIP SELECT
	XCS	X CHIP SELECT
	XCSYNC	X COMPOSITE SYNC
	XDS	X DATA STROBE
	XHSYNCO	X HORIZONTAL SYNC OUTPUT
	XHINT	XH INTERRUPT REQUEST
	XI	X□ TAL OSCILLATOR INPUT
	XINT	X INTERRUPT
	XMW	X MEMORY WRITE ENABLE
	XO	X□ TAL OSCILLATOR OUTPUT
	XRE	X READ ENABLE
	XSRMCE	X SRAM CHIP ENABLE
	XSRMOE	X SRAM OUTPUT ENABLE
	XSRMWE	X SRAM WRITE ENABLE
	XVCS	X V-DEC CHIP SELECT
	XVDS	X V-DEC CONTROL BUS STROBE
	XVSYNCO	X VERTICAL SYNC OUTPUT

17 Block Diagram

17.1 Power Supply Block Diagram



17.2 Analog Video Block Diagram

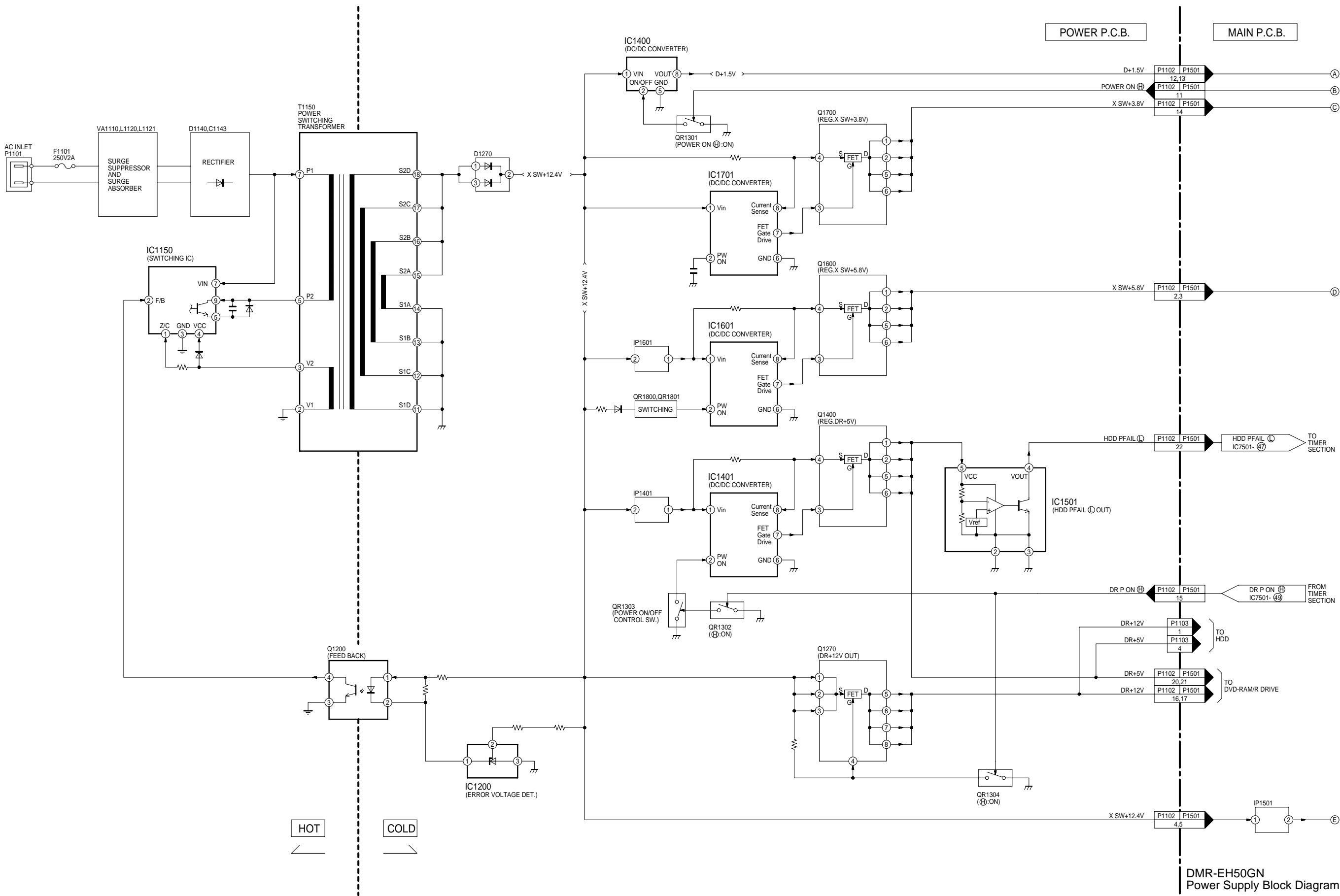


17.3 Analog Audio Block Diagram

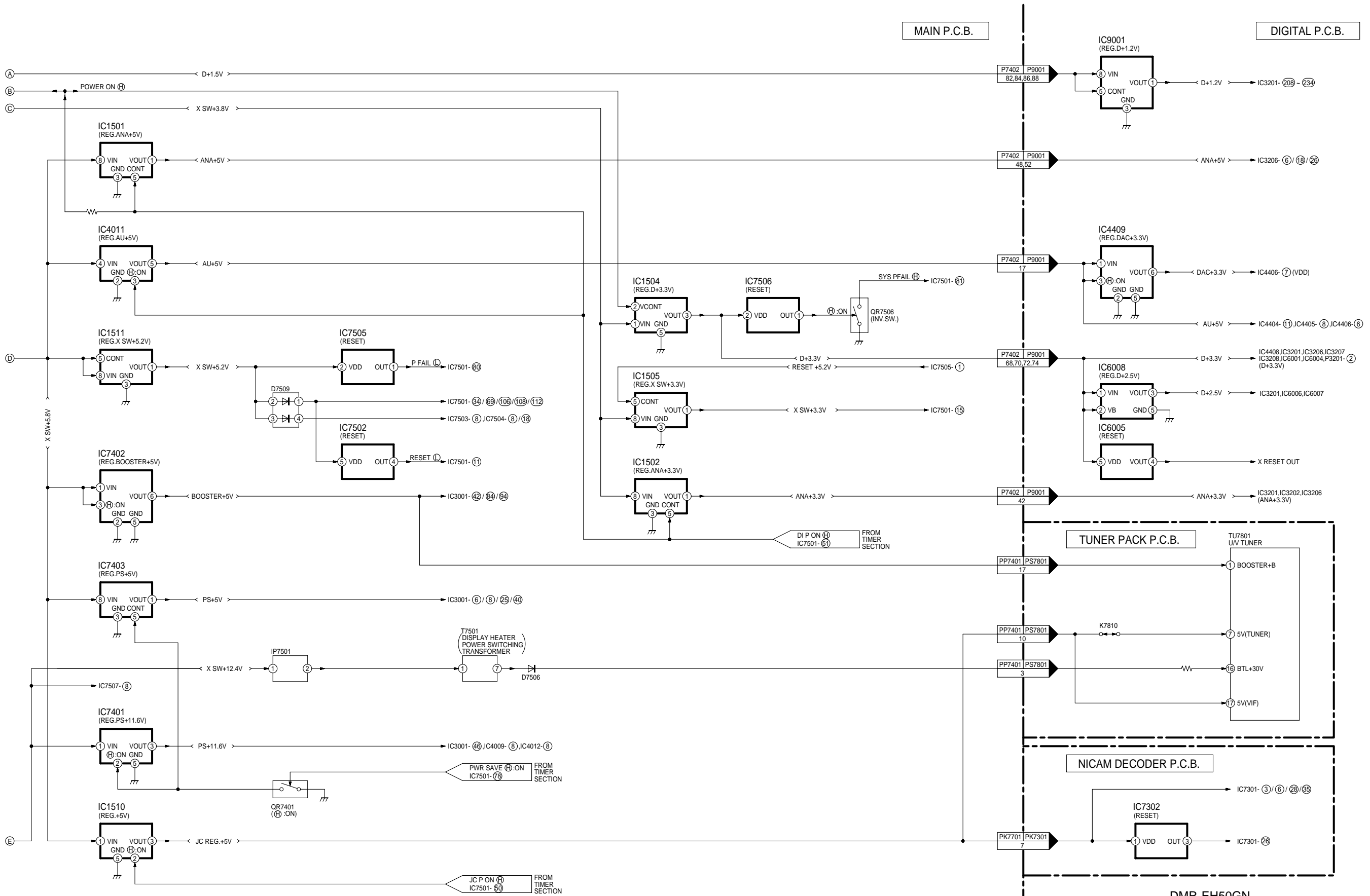


17.4 Timer Block Diagram





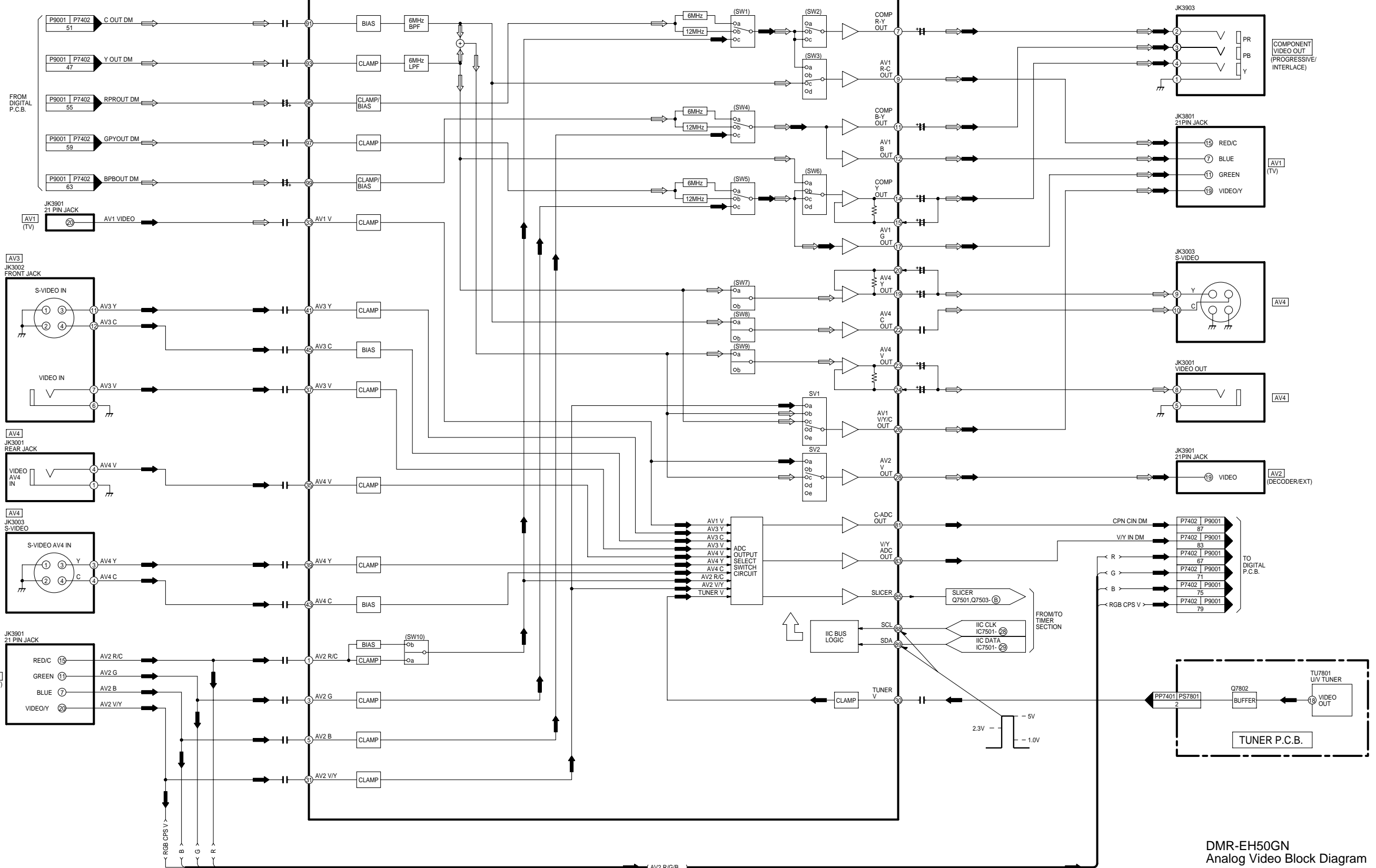
DMR-EH50GN
Power Supply Block Diagram



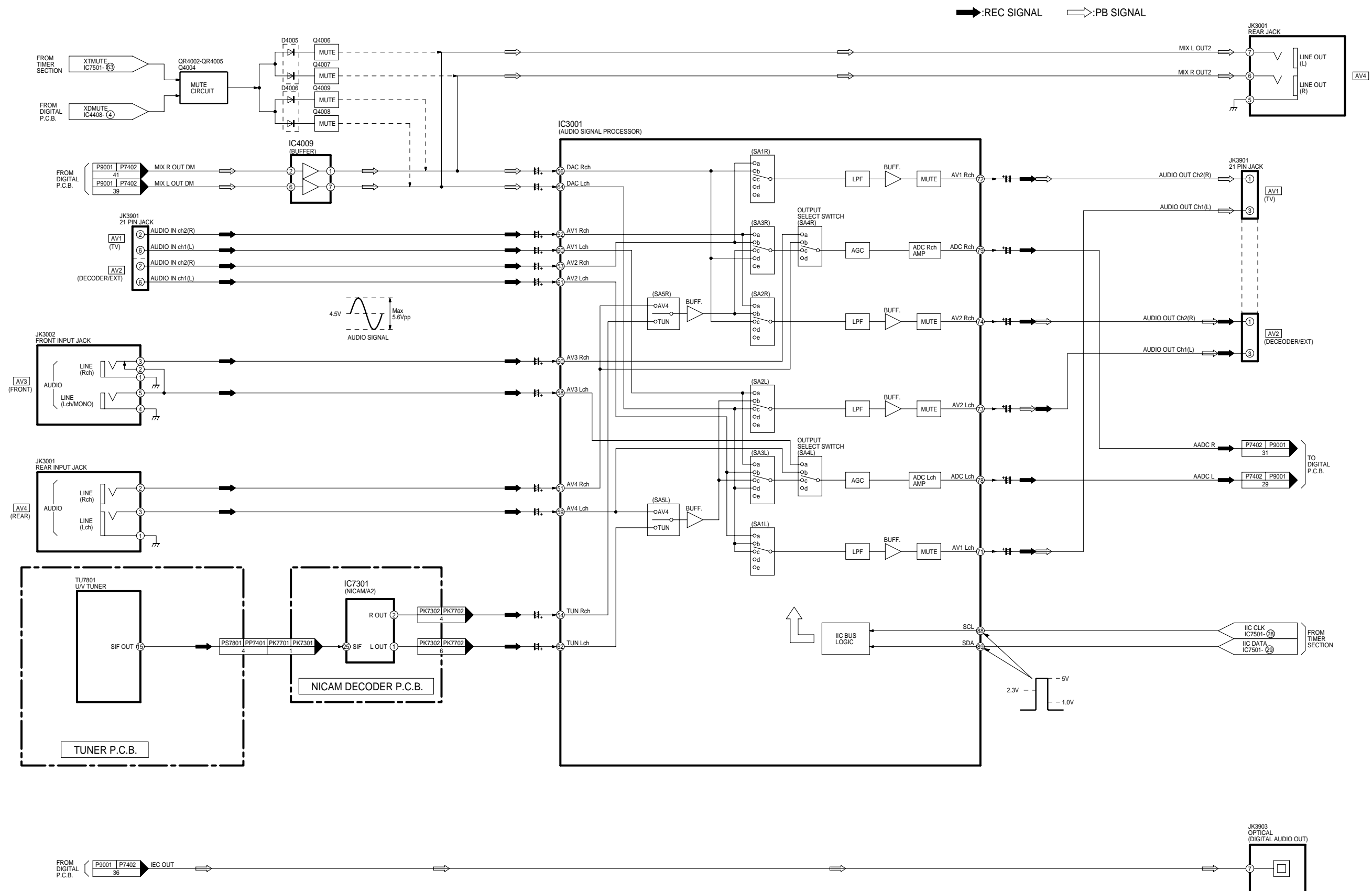
➡:REC SIGNAL ➡:PB SIGNAL

MAIN P.C.B.

IC3001
(VIDEO PROCESSOR)



DMR-EH50GN
Analog Video Block Diagram



DMR-EH50GN
Analog Audio Block Diagram

19 Print Circuit Board

19.1 Power P.C.B.



19.2 Main P.C.B.

19.2.1 Main P.C.B. (1/4 Section)



19.2.2 Main P.C.B. (2/4 Section)



19.2.3 Main P.C.B. (3/4 Section)



19.2.4 Main P.C.B. (4/4 Section)



19.2.5 Main P.C.B. Address Information



19.3 Tuner P.C.B., LED P.C.B., Front (L) P.C.B.



19.4 Nicam Decoder P.C.B.



19.5 SD Card P.C.B.



C

B

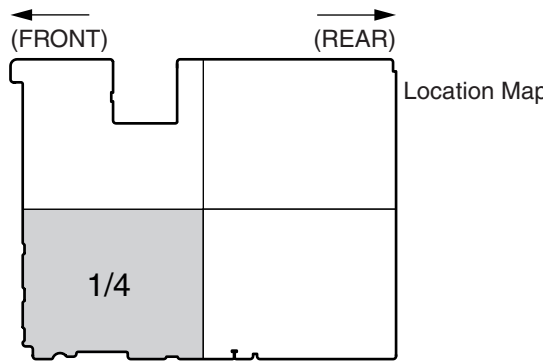
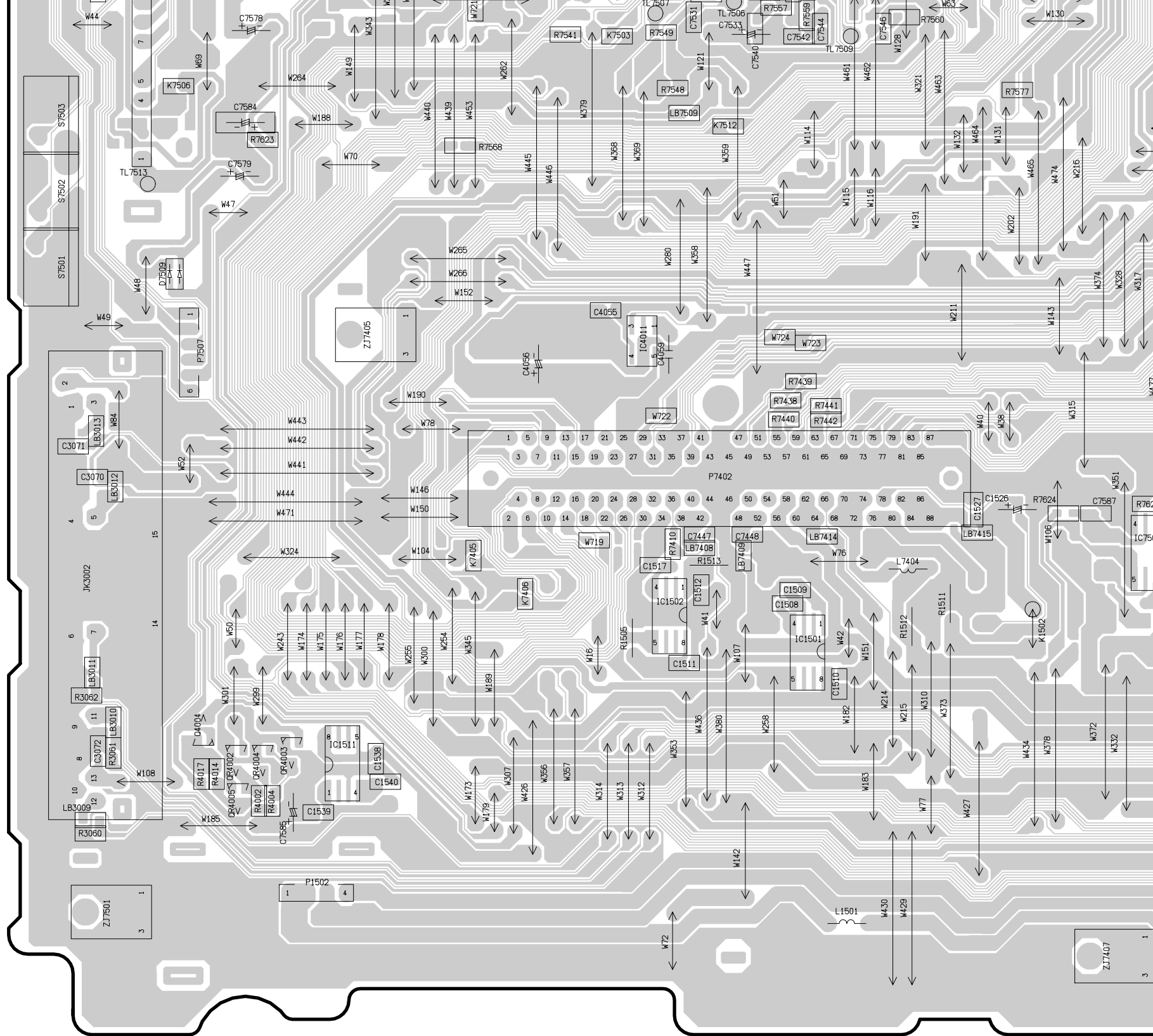
A

1

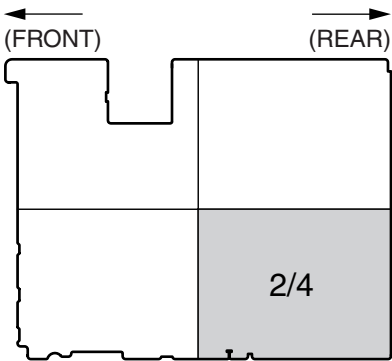
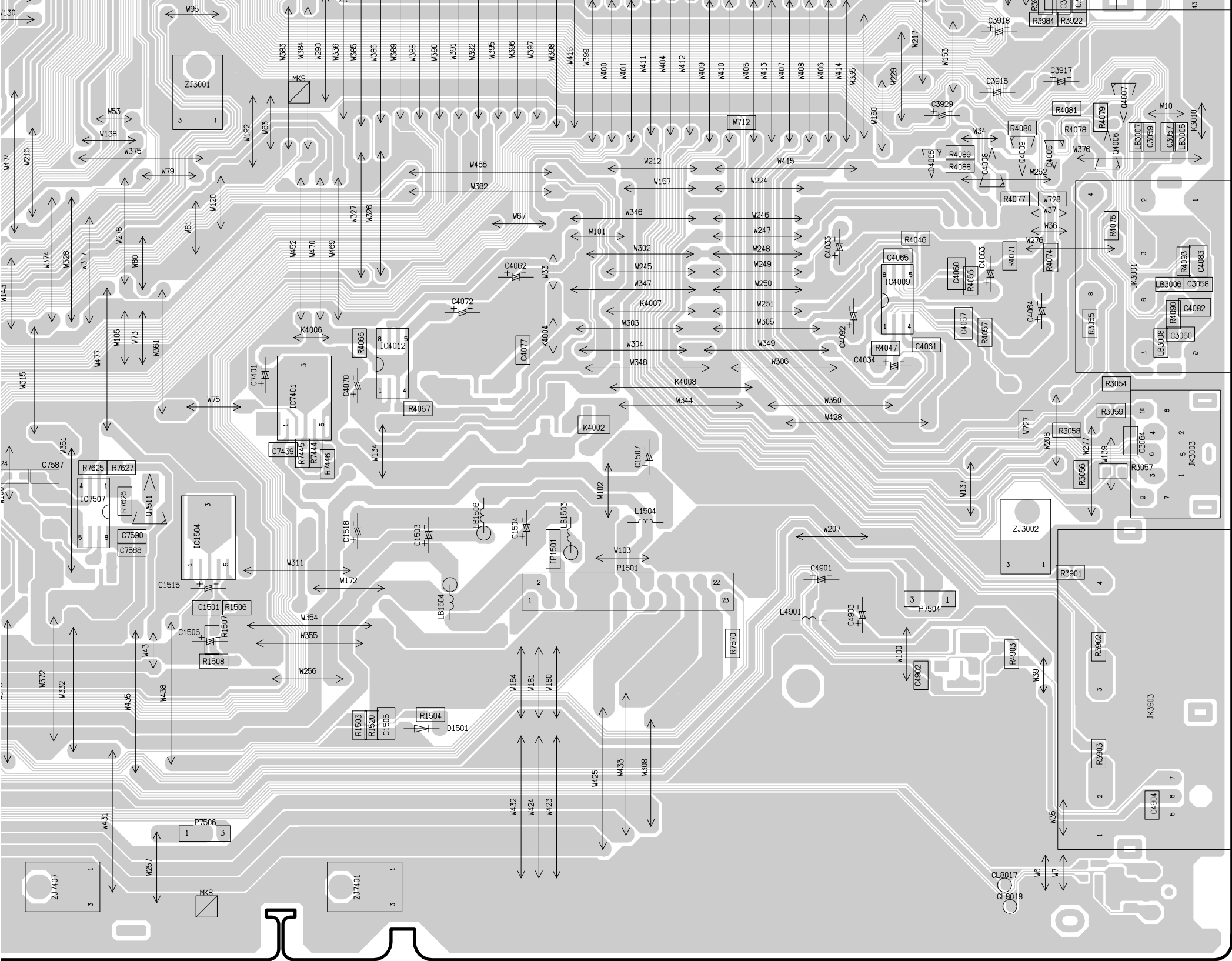
2

3

4

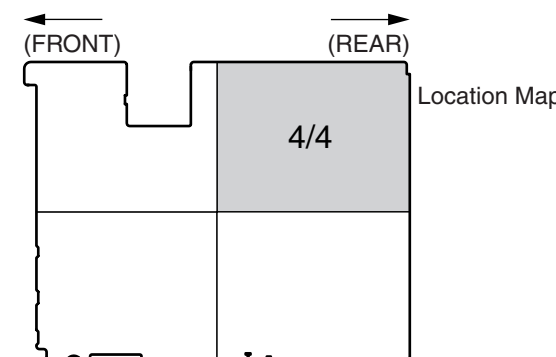
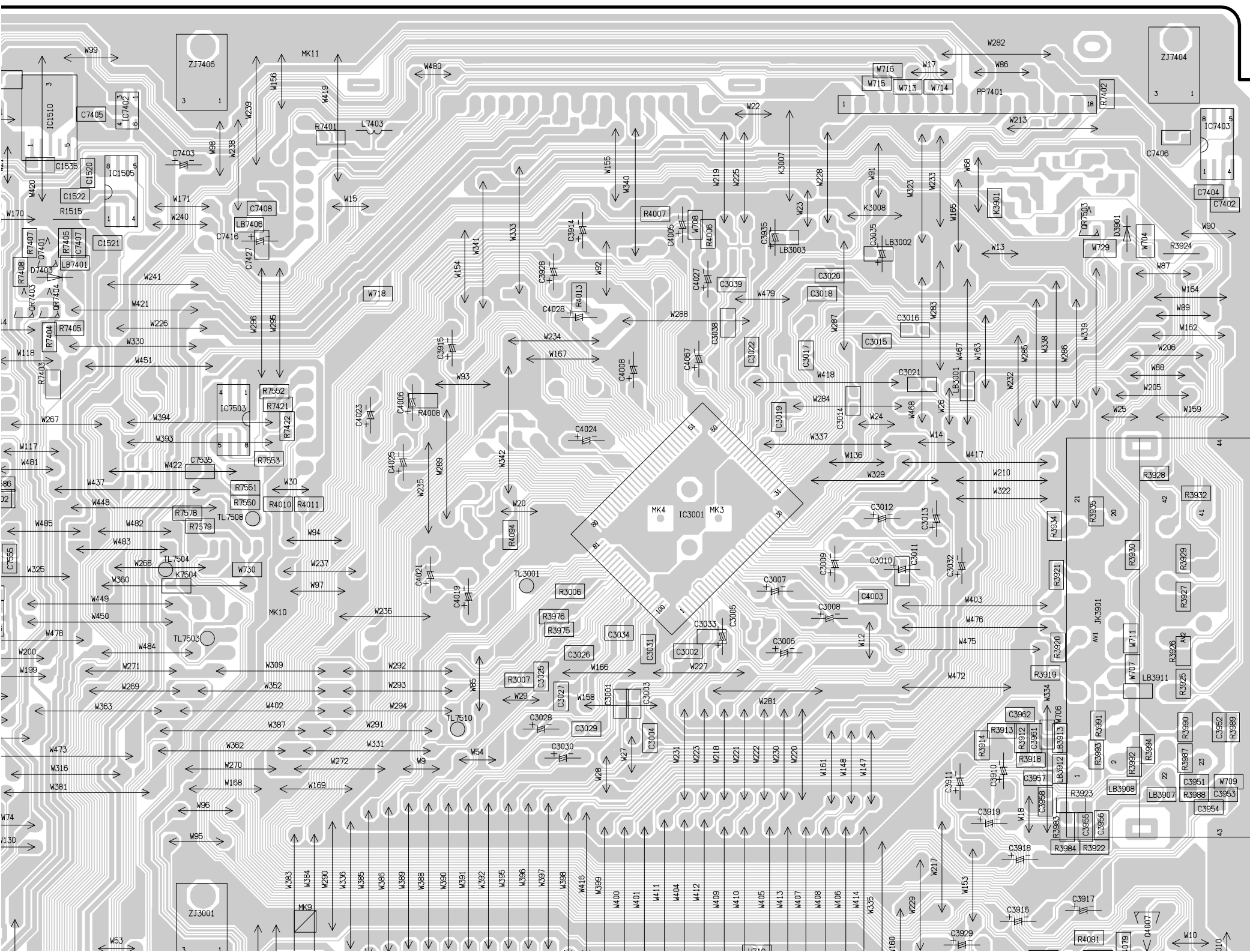


DMR-EH50GN
Main P.C.B. (VEP79107K)
(1/4 Section)



DMR-EH50GN
Main P.C.B. (VEP79107K)
(2/4 Section)

DMR-EH50GN
Main P.C.B. (VEP79107K)
(3/4 Section)



DMR-EH50GN
Main P.C.B. (VEP79107K)
(4/4 Section)

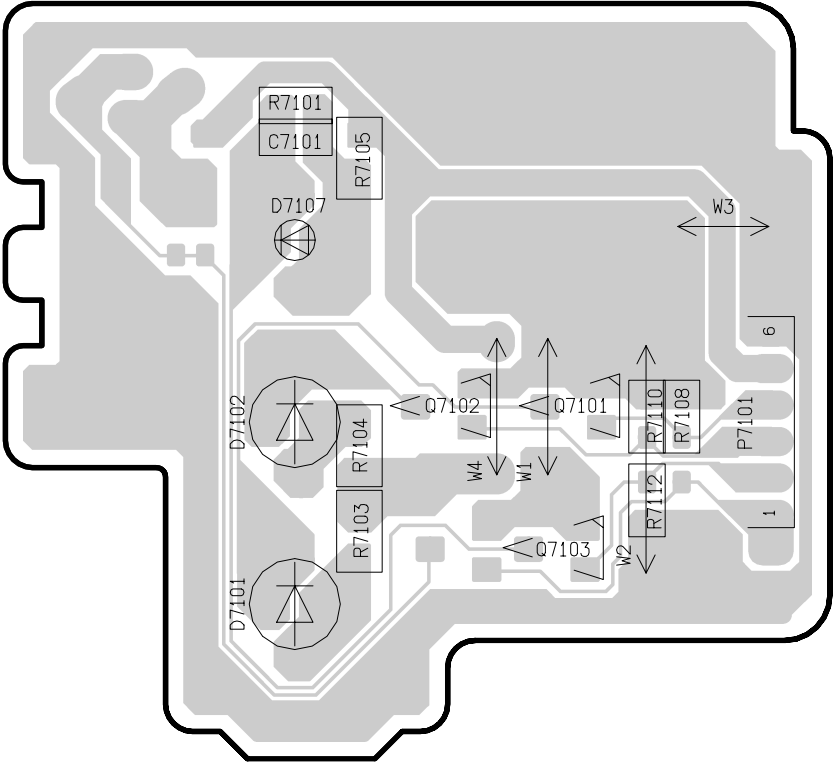
Main P.C.B.															
Integrated Circuit		D4006	C-7	C1510	B-4	C3929	C-7	C7516	D-3	R3901	B-7	R7405	E-4	R7588	E-4
IC1501	B-4	D7403	E-4	C1511	B-3	C3935	E-7	C7517	D-3	R3902	B-8	R7406	E-4	R7589	E-4
IC1502	B-3	D7501	E-2	C1512	B-3	C3951	D-8	C7518	D-3	R3903	A-8	R7407	E-4	R7590	E-4
IC1504	B-5	D7502	E-4	C1515	B-5	C3952	D-8	C7519	D-3	R3912	D-7	R7408	E-4	R7597	F-2
IC1505	F-5	D7504	F-2	C1517	B-3	C3953	D-8	C7520	D-3	R3913	D-7	R7410	B-3	R7598	F-2
IC1510	F-4	D7505	F-2	C1518	B-5	C3954	D-8	C7522	D-3	R3914	D-7	R7421	E-5	R7599	F-2
IC1511	B-2	D7506	E-2	C1520	F-4	C3955	D-7	C7523	D-3	R3918	D-7	R7422	E-5	R7600	E-3
IC3001	E-6	D7507	E-2	C1521	E-5	C3956	D-7	C7524	D-3	R3919	D-7	R7438	C-3	R7601	E-3
IC4009	C-7	D7508	F-2	C1522	F-4	C3957	D-7	C7528	D-3	R3920	D-7	R7439	C-3	R7606	E-3
IC4011	C-3	D7509	C-2	C1526	B-4	C3958	D-7	C7529	D-3	R3921	D-7	R7440	C-3	R7607	D-3
IC4012	C-5	Crystal Osillator		C1527	B-4	C3961	D-7	C7531	D-3	R3922	D-7	R7441	C-4	R7608	E-3
IC7401	B-5	X7501	D-3	C1535	F-4	C3962	D-7	C7532	D-3	R3923	D-7	R7442	C-4	R7612	E-2
IC7402	F-5	X7502	D-3	C1536	F-4	C4003	D-7	C7533	D-3	R3924	E-8	R7444	B-5	R7614	F-2
IC7403	F-8	IC Protector		C1538	B-2	C4005	E-6	C7534	D-4	R3925	D-8	R7445	B-5	R7615	F-2
IC7501	D-3	IP1501	B-6	C1539	A-2	C4006	E-5	C7535	E-5	R3926	D-8	R7446	B-5	R7616	E-3
IC7502	D-3	IP7501	E-2	C1540	A-2	C4008	E-6	C7539	D-3	R3927	D-8	R7501	E-2	R7617	F-2
IC7503	E-5	Coil		C3001	D-6	C4019	D-6	C7540	D-3	R3928	E-8	R7502	E-2	R7618	F-2
IC7504	D-2	L1501	A-4	C3002	D-6	C4021	D-5	C7541	D-3	R3929	D-8	R7503	E-2	R7619	E-3
IC7505	E-3	L1504	B-6	C3003	D-6	C4023	E-5	C7542	D-3	R3930	D-8	R7504	E-2	R7620	E-4
IC7506	D-4	L4901	B-7	C3004	D-6	C4024	E-6	C7543	D-4	R3932	E-8	R7505	E-2	R7621	D-3
IC7507	B-4	L7403	F-5	C3005	D-6	C4025	E-5	C7544	D-4	R3934	E-7	R7506	E-2	R7622	D-4
Transistor		L7404	B-4	C3006	D-7	C4027	E-6	C7546	D-4	R3935	E-7	R7507	E-3	R7623	C-2
Q4004	B-2	L7501	E-2	C3007	D-7	C4028	E-6	C7547	D-4	R3975	D-6	R7508	E-2	R7624	B-4
Q4006	C-8	LB1503	B-6	C3008	D-7	C4033	C-7	C7550	D-4	R3976	D-6	R7510	E-2	R7625	B-4
Q4007	C-8	LB1504	B-6	C3009	D-7	C4034	C-7	C7551	D-4	R3983	D-7	R7518	D-2	R7626	B-5
Q4008	C-7	LB1506	B-6	C3010	D-7	C4055	C-3	C7552	E-4	R3984	D-7	R7527	D-3	R7627	B-5
Q4009	C-7	LB3001	E-7	C3011	D-7	C4056	C-3	C7553	E-4	R3987	D-8	R7528	D-3	R7628	D-4
Q7401	E-4	LB3002	E-7	C3012	E-7	C4057	C-7	C7554	E-4	R3988	D-8	R7529	D-3	R7629	D-2
Q7501	E-2	LB3003	E-7	C3013	E-7	C4059	C-3	C7555	D-4	R3989	D-8	R7531	D-3	R7630	D-2
Q7502	E-2	LB3005	C-8	C3014	E-7	C4060	C-7	C7565	E-2	R3990	D-8	R7532	D-3	R7631	D-2
Q7503	E-2	LB3006	C-8	C3015	E-7	C4061	C-7	C7569	F-2	R3991	D-7	R7533	D-3	R7639	D-1
Q7504	E-3	LB3007	C-8	C3016	E-7	C4062	C-6	C7570	F-2	R3992	D-8	R7534	D-3	R7640	E-1
Q7506	E-4	LB3008	C-8	C3017	E-7	C4063	C-7	C7571	E-2	R3993	D-7	R7535	D-3	R7641	D-1
Q7507	E-4	LB3009	A-1	C3018	E-7	C4064	C-7	C7572	F-2	R3994	D-8	R7536	D-3	R7642	D-1
Q7508	E-4	LB3010	B-2	C3019	E-6	C4065	C-7	C7573	F-2	R4002	A-2	R7537	D-3	R7643	D-1
Q7510	E-2	LB3011	B-2	C3020	E-7	C4067	E-6	C7577	E-4	R4004	A-2	R7543	D-3	R7644	E-1
Q7511	B-5	LB3012	B-2	C3021	E-7	C4070	B-5	C7578	D-2	R4006	E-6	R7544	D-3	R7648	F-1
Transistor-resistor		LB3013	B-2	C3022	E-6	C4072	C-6	C7579	C-2	R4007	F-6	R7548	C-3	R7649	D-4
QR4002	B-2	LB3907	D-8	C3025	D-6	C4077	C-6	C7581	D-4	R4008	E-5	R7549	D-3	R7651	D-3
QR4003	B-2	LB3908	D-8	C3026	D-6	C4082	C-8	C7584	C-2	R4010	E-5	R7550	E-5	R7652	D-4
QR4004	B-2	LB3911	D-8	C3027	D-6	C4083	C-8	C7585	A-2	R4011	E-5	R7551	E-5	R7653	D-4
QR4005	A-2	LB3912	D-7	C3028	D-6	C4092	C-7	C7587	B-4	R4013	E-6	R7552	E-5	R7655	D-3
QR7401	D-4	LB3913	D-7	C3029	D-6	C4901	B-7	C7588	B-5	R4014	B-2	R7553	E-5	Transformer	
QR7403	E-4	LB7401	E-4	C3030	D-6	C4902	B-7	C7590	B-5	R4017	B-2	R7557	D-3		
QR7404	E-4	LB7406	E-5	C3031	D-6	C4903	B-7	C7592	F-1	R4046	C-7	R7558	D-3		
QR7503	E-7	LB7408	B-3	C3032	D-7	C4904	A-8	Resistor		R4047	C-7	R7559	D-4		
QR7506	D-4	LB7409	B-3	C3033	D-6	C7401	B-5	R1503	A-5	R4055	C-7	R7560	D-4		
QR7507	D-3	LB7414	B-4	C3034	D-6	C7402	F-8	R1504	B-5	R4057	C-7	R7561	D-4		
QR7508	E-2	LB7415	B-4	C3035	E-7	C7403	F-5	R1505	B-3	R4066	C-5	R7562	D-4		
Test Point		LB7501	E-2	C3038	E-6	C7404	F-8	R1506	B-5	R4067	B-5	R7563	D-4		
TW7501	D-2	LB7507	D-3	C3039	E-6	C7405	F-4	R1507	B-5	R4071	C-7	R7564	D-4		
Connector		LB7508	D-3	C3057	C-8	C7406	F-8	R1508	B-5	R4074	C-7	R7565	D-4		
JK3001	C-8	LB7509	C-3	C3058	C-8	C7407	E-4	R1511	B-4	R4076	C-8	R7566	D-4		
JK3002	B-2	LB7510	D-4	C3059	C-8	C7408	F-5	R1512	B-4	R4077	C-7	R7568	C-3		
JK3003	B-8	LB7515	F-3	C3060	C-8	C7416	E-5	R1513	B-3	R4078	C-7	R7570	B-6		
JK3901	D-8	LB7516	E-2	C3064	B-8	C7427	E-5	R1515	F-4	R4079	C-8	R7571	D-4		
JK3903	B-8	LB7517	F-2	C3070	B-2	C7439	B-5	R1520	A-5	R4080	C-7	R7574	D-4		
P1501	B-6	LB7518	E-2	C3071	B-1	C7447	B-3	R3006	D-6	R4081	C-7	R7575	D-4		
P1502	A-2	LB7519	E-2	C3072	B-2	C7448	B-3	R3007	D-6	R4088	C-7	R7576	D-4		
P7402	B-3	Capacitor		C3910	D-7	C7501	E-2	R3054	C-8	R4089	C-7	R7577	C-4		
P7504	B-7	C1501	B-5	C3911	D-7	C7502	E-2	R3055	C-7	R4090	C-8	R7578	E-5		
P7506	A-5	C1503	B-6	C3914	E-6	C7503	E-2	R3056	B-7	R4093	C-8	R7579	E-5		
P7507	C-2	C1504	B-6	C3915	E-6	C7504	E-2	R3057	B-8	R4094	E-6	R7582	D-4		
PP7401	F-7	C1505	B-5	C3916	C-7	C7505	E-3	R3058	B-7	R4903	B-7	R7583	E-4		
Diode		C1506	B-5	C3917	C-7	C7507	E-2	R3059	B-8	R7401	F-5	R7584	E-4		
D1501	A-5	C1507	B-6	C3918	D-7	C7510	D-2	R3060	A-1	R7402	F-7	R7585	E-4		
D3901	E-8	C1508	B-3	C3919	D-7	C7511	D-2	R3061	B-2	R7403	E-4	R7586	E-4		
D4005	C-7	C1509	B-3	C3928	E-6	C7512	D-2	R3062	B-1	R7404	E-4	R7587	E-4		

A

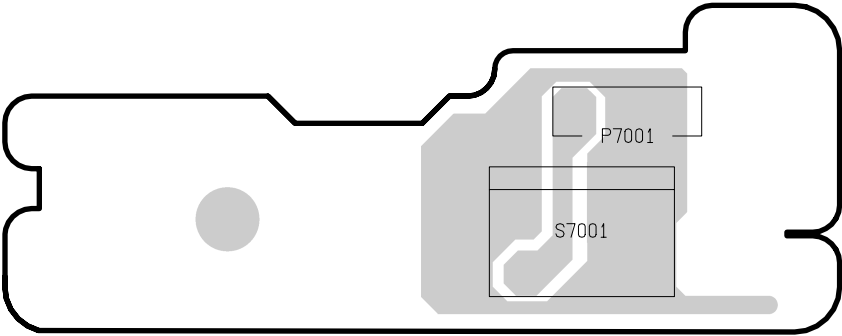


DMR-EH50GN
Tuner Pack P.C.B. (VEP07A77C)

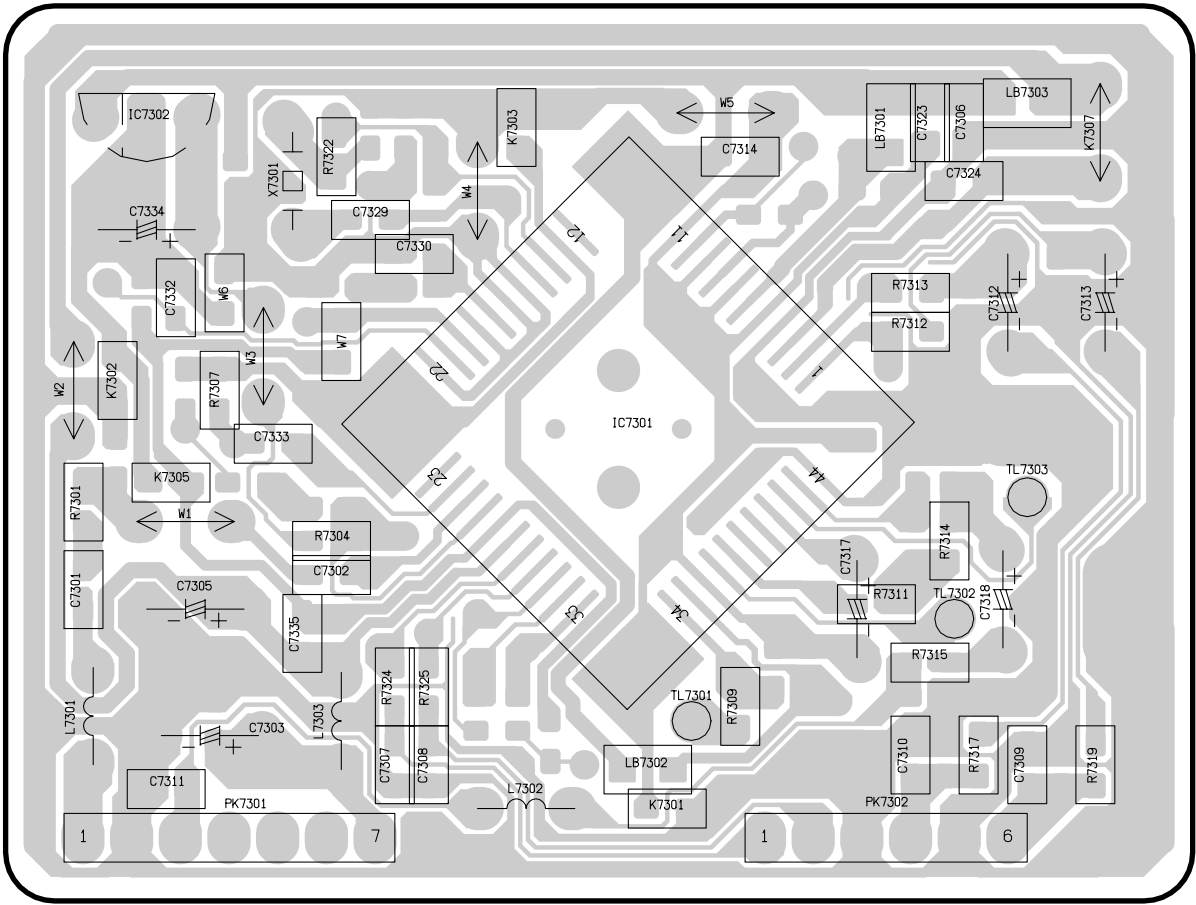
LED P.C.B.



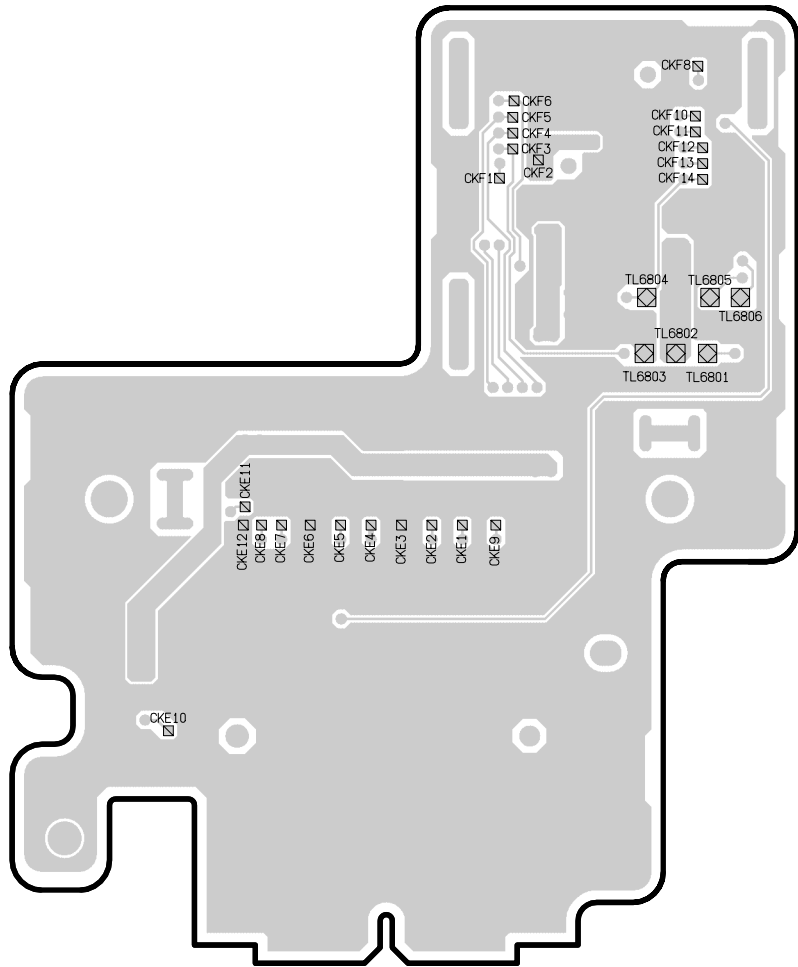
Front (L) P.C.B.



Nicam Decoder P.C.B.

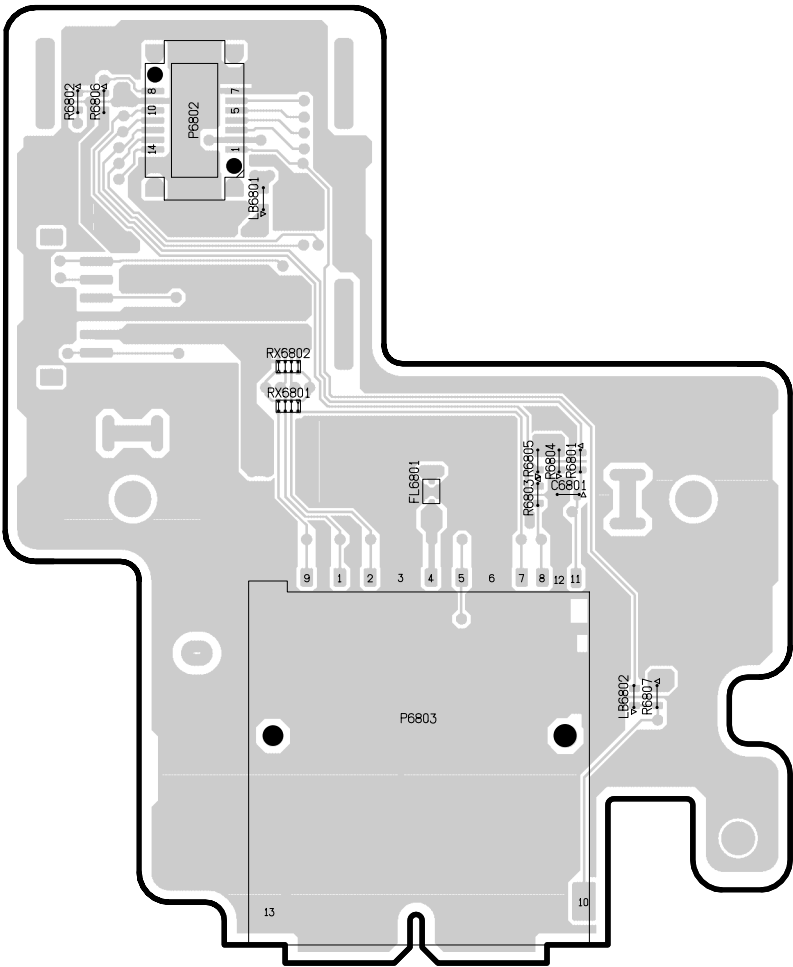


SD Card P.C.B.



(Component Side)

DMR-EH50GN
SD Card P.C.B. (Component Side)
(VEP73121D)

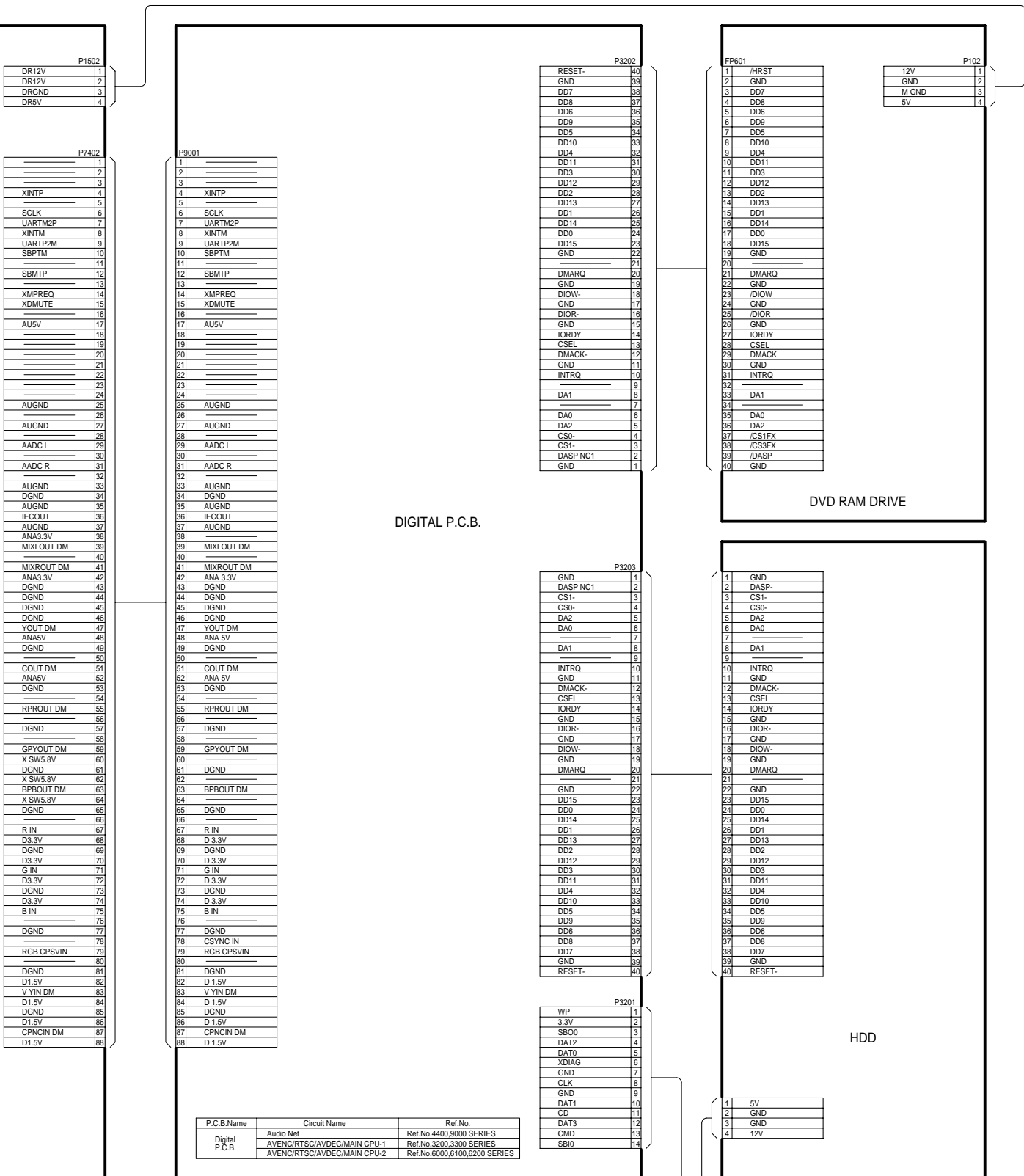


(Foil Side)

DMR-EH50GN
SD Card P.C.B. (Foil Side)
(VEP73121D)

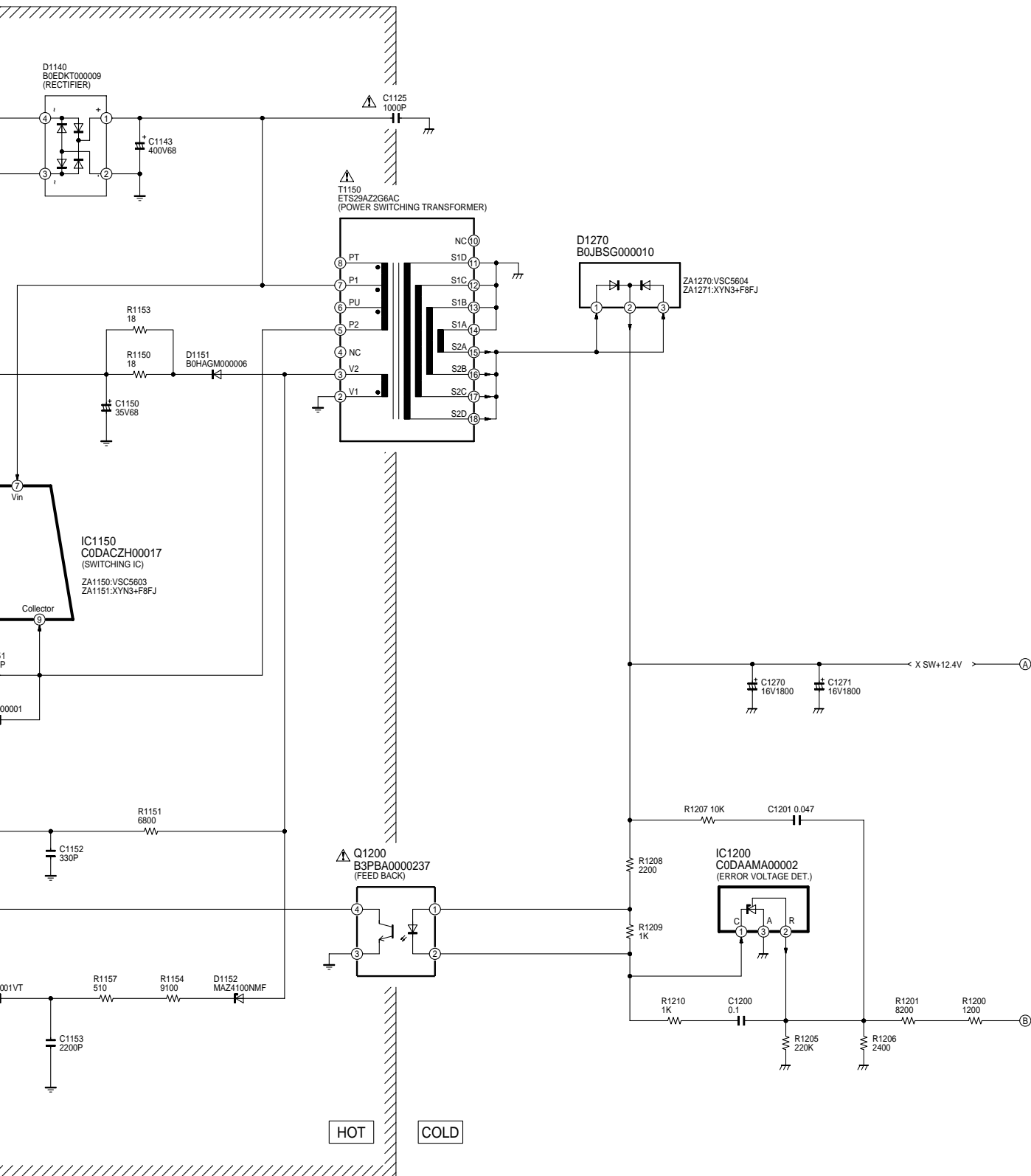
18.1. Interconnection Schematic Diagram





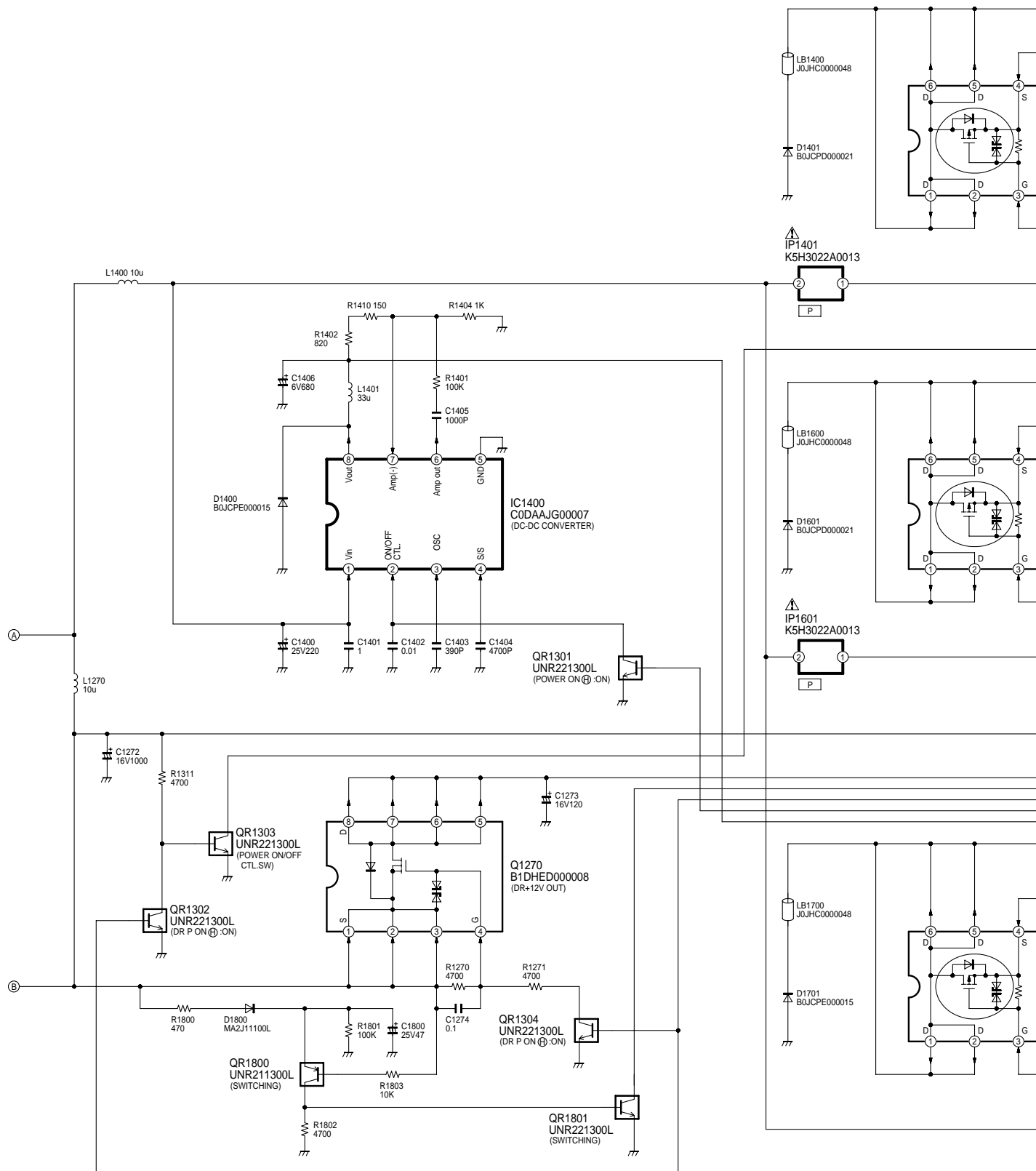
DMR-EH50GN
Interconnection
Schematic Diagram





DMR-EH50GN
Power Supply
Schematic Diagram

©



©

12

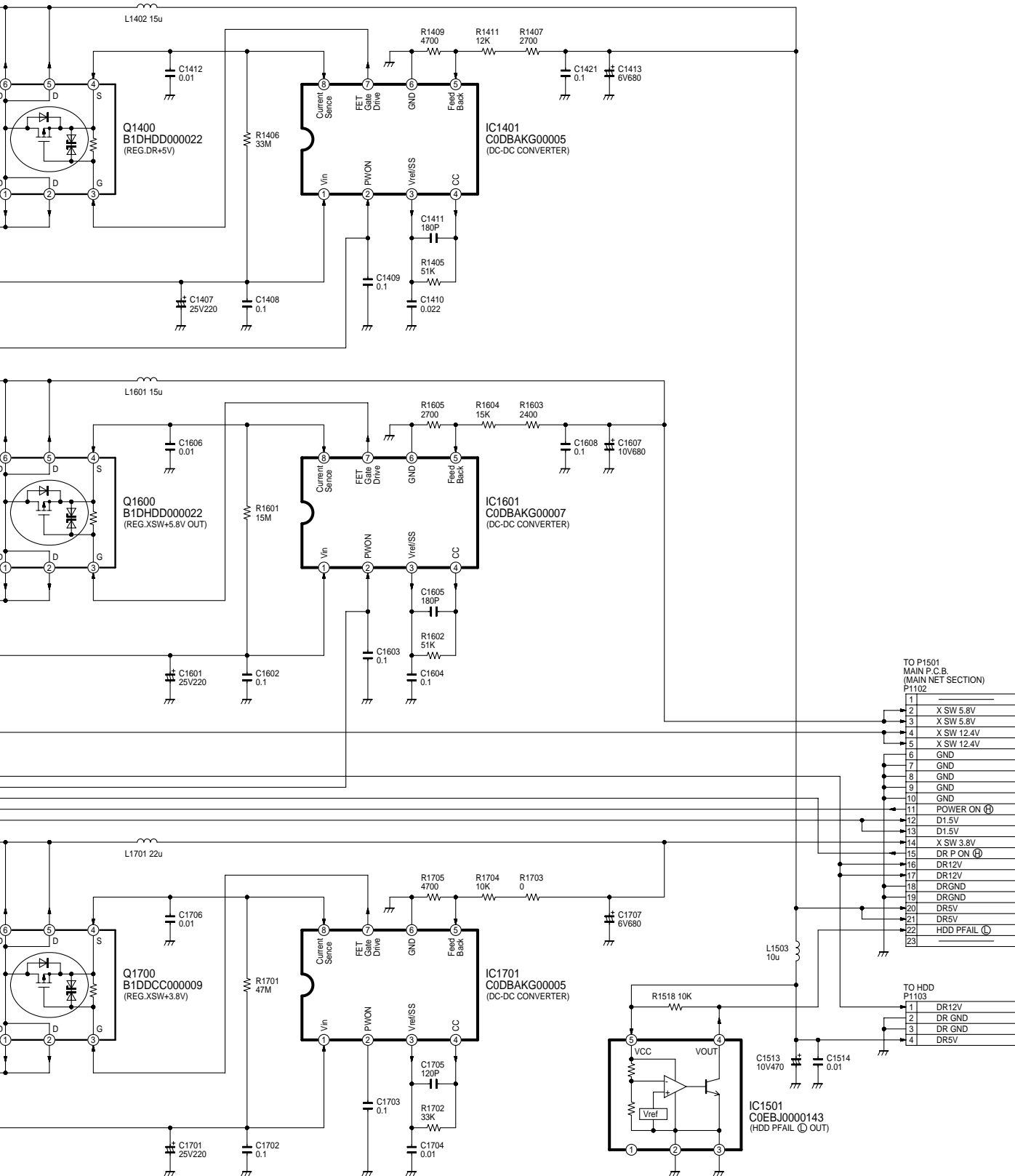
13

14

15

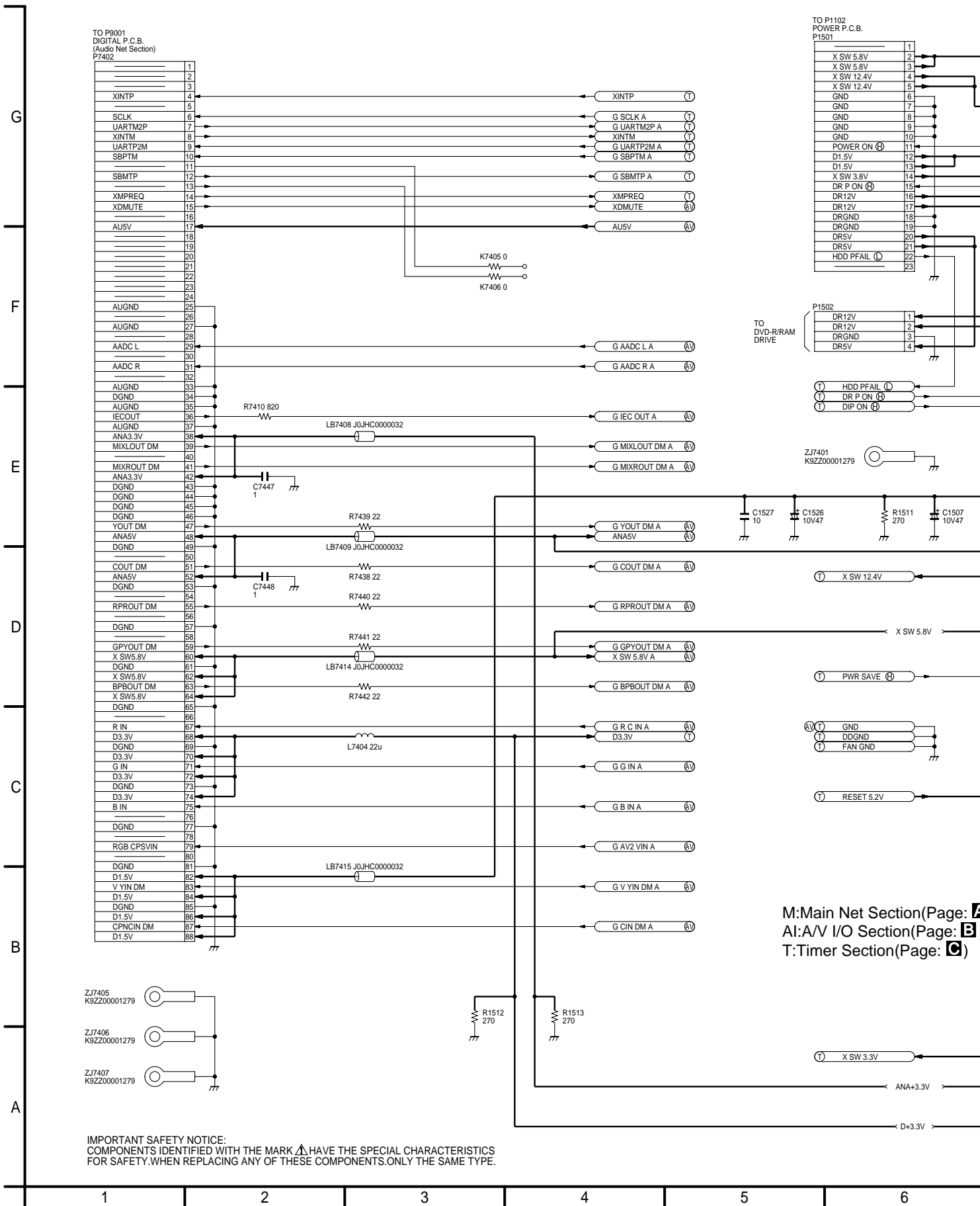
16

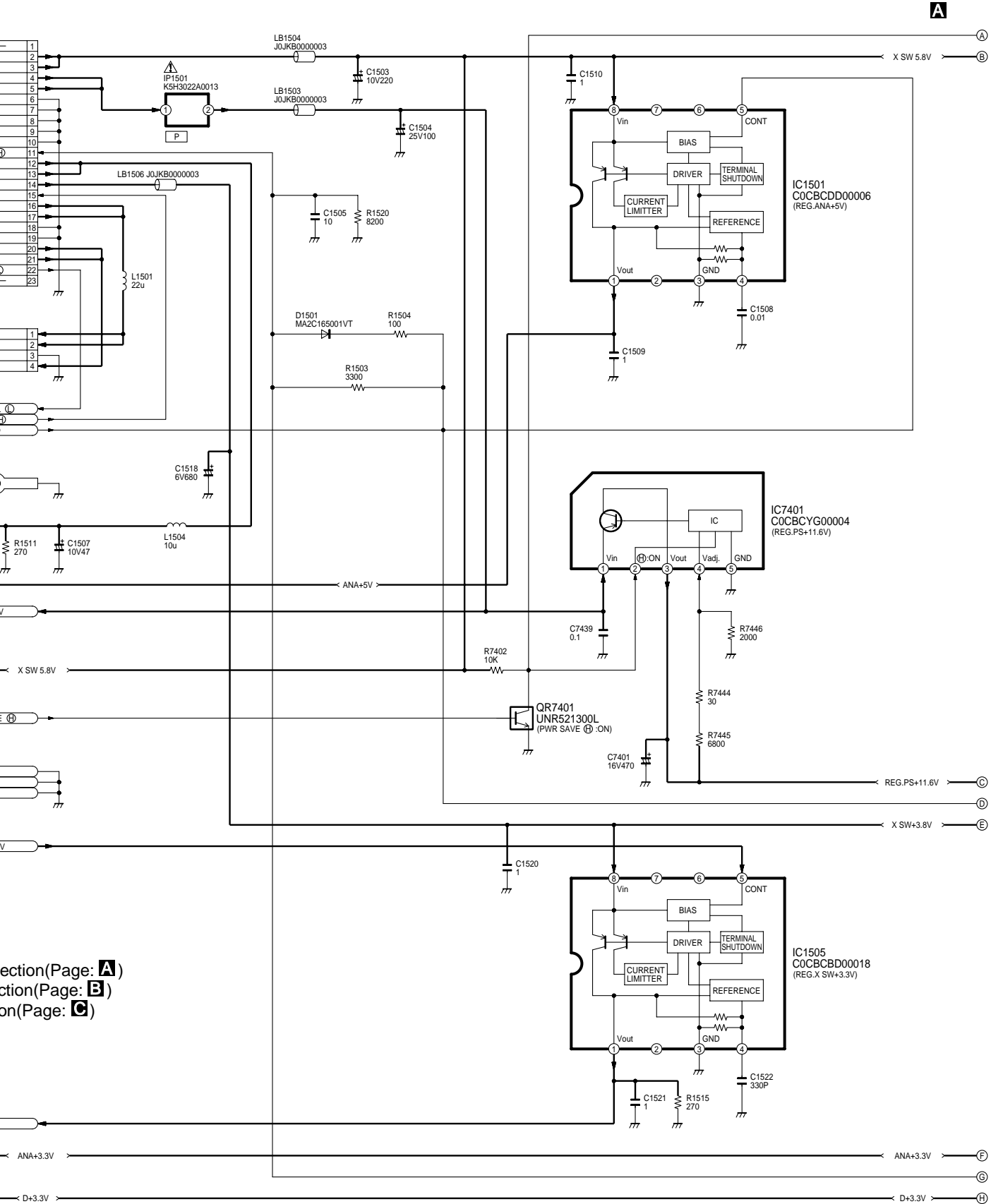
17



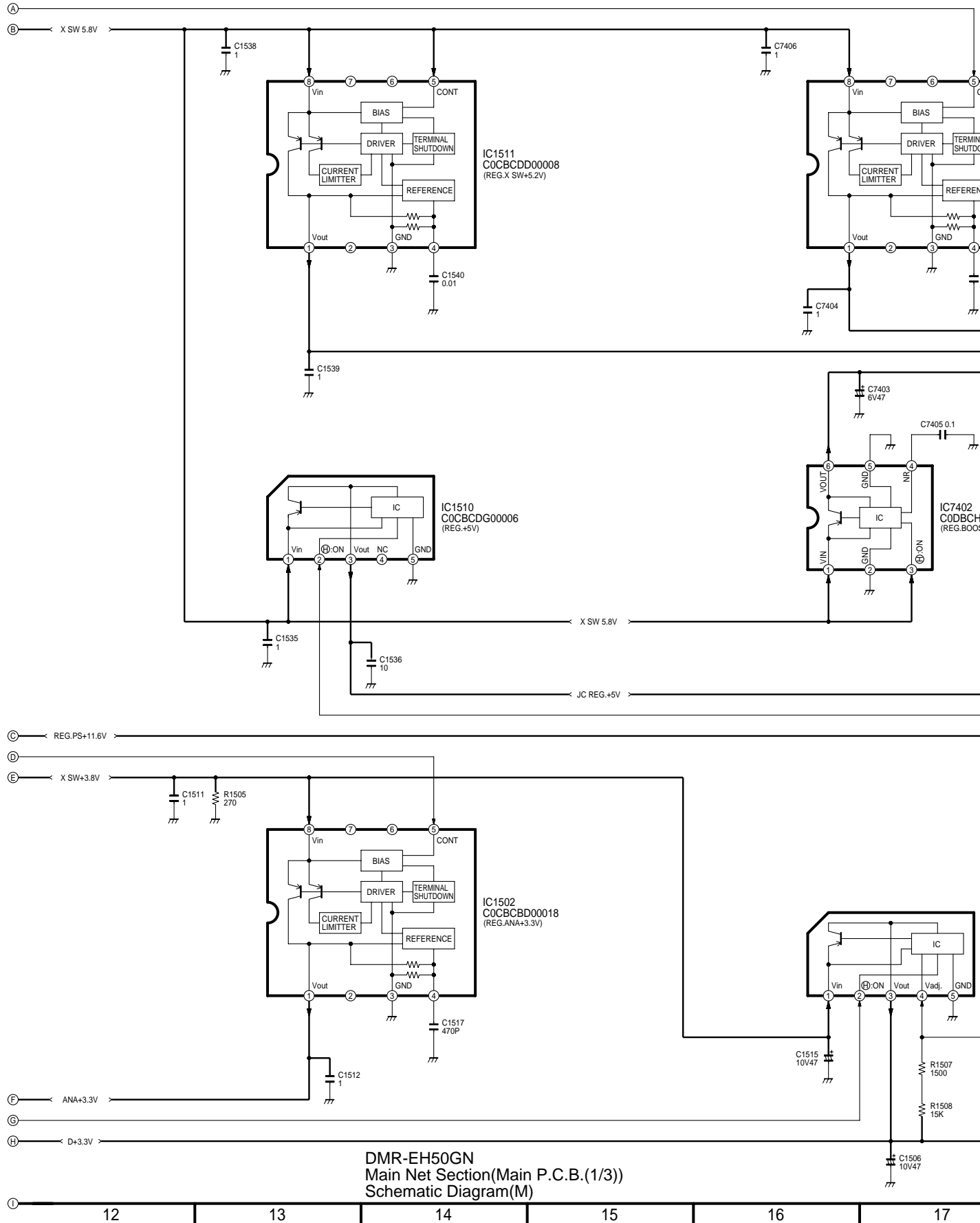
DMR-EH50GN
Power Supply
Schematic Diagram

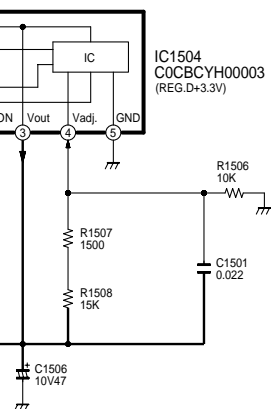
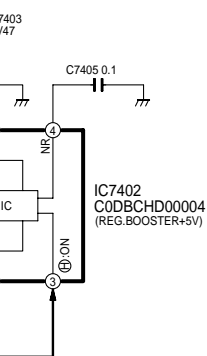
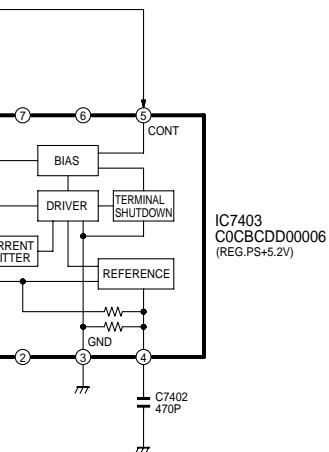
18.3. Main Net Section (Main P.C.B. (1/3)) Schematic Diagram (M)



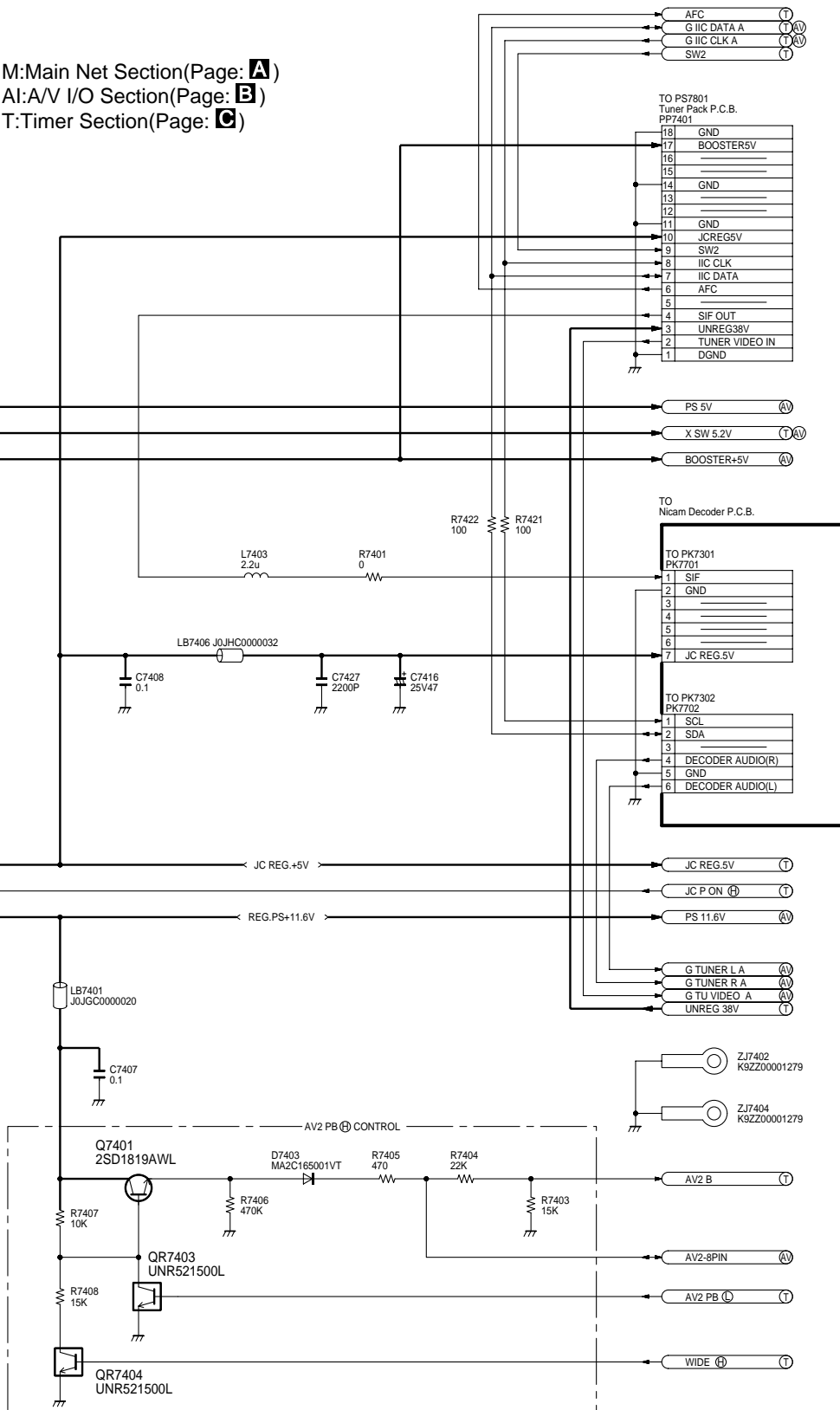


DMR-EH50GN
Main Net Section(Main P.C.B.(1/3))
Schematic Diagram(M)





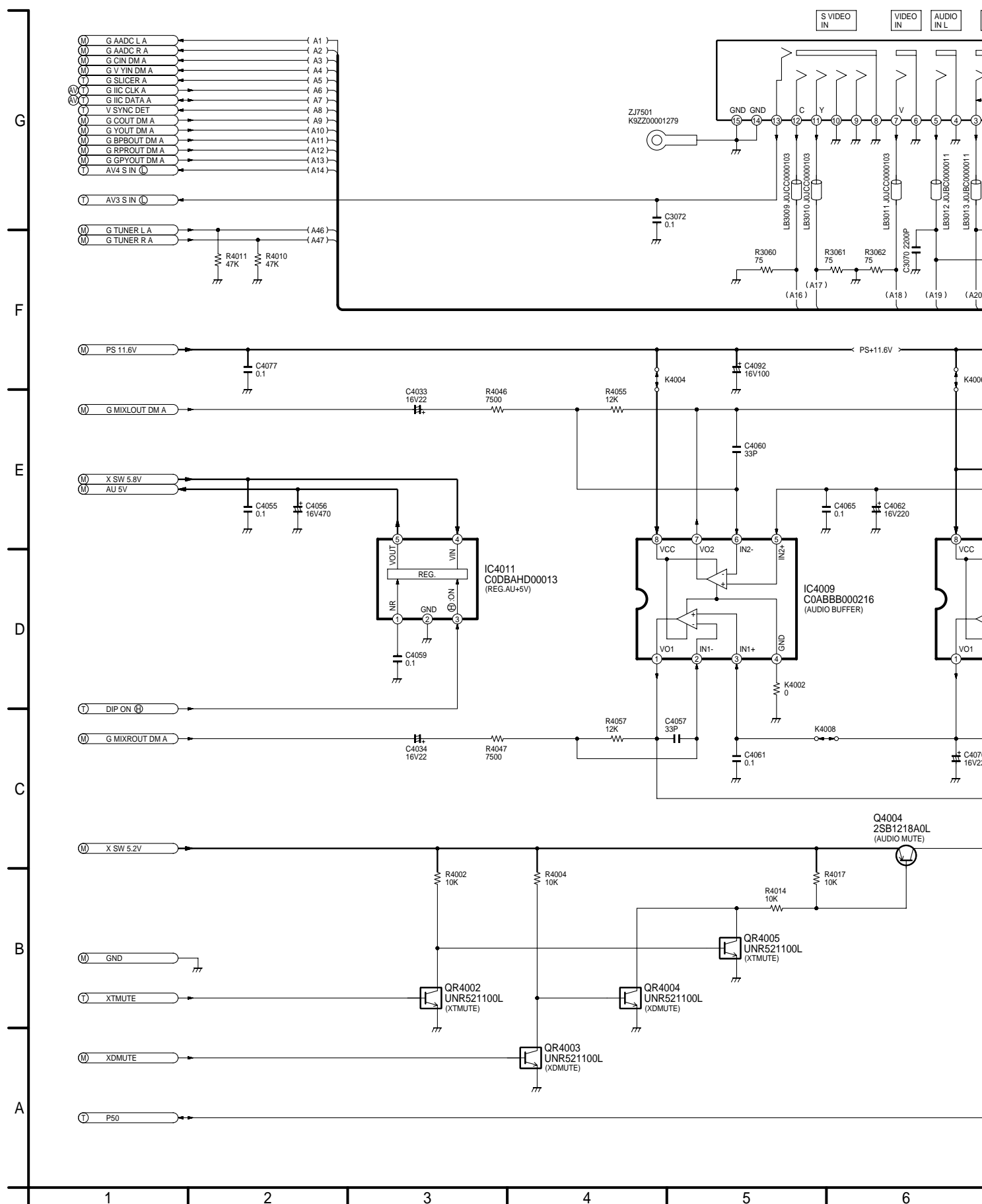
M:Main Net Section(Page: **A**)
 AI:A/V I/O Section(Page: **B**)
 T:Timer Section(Page: **C**)

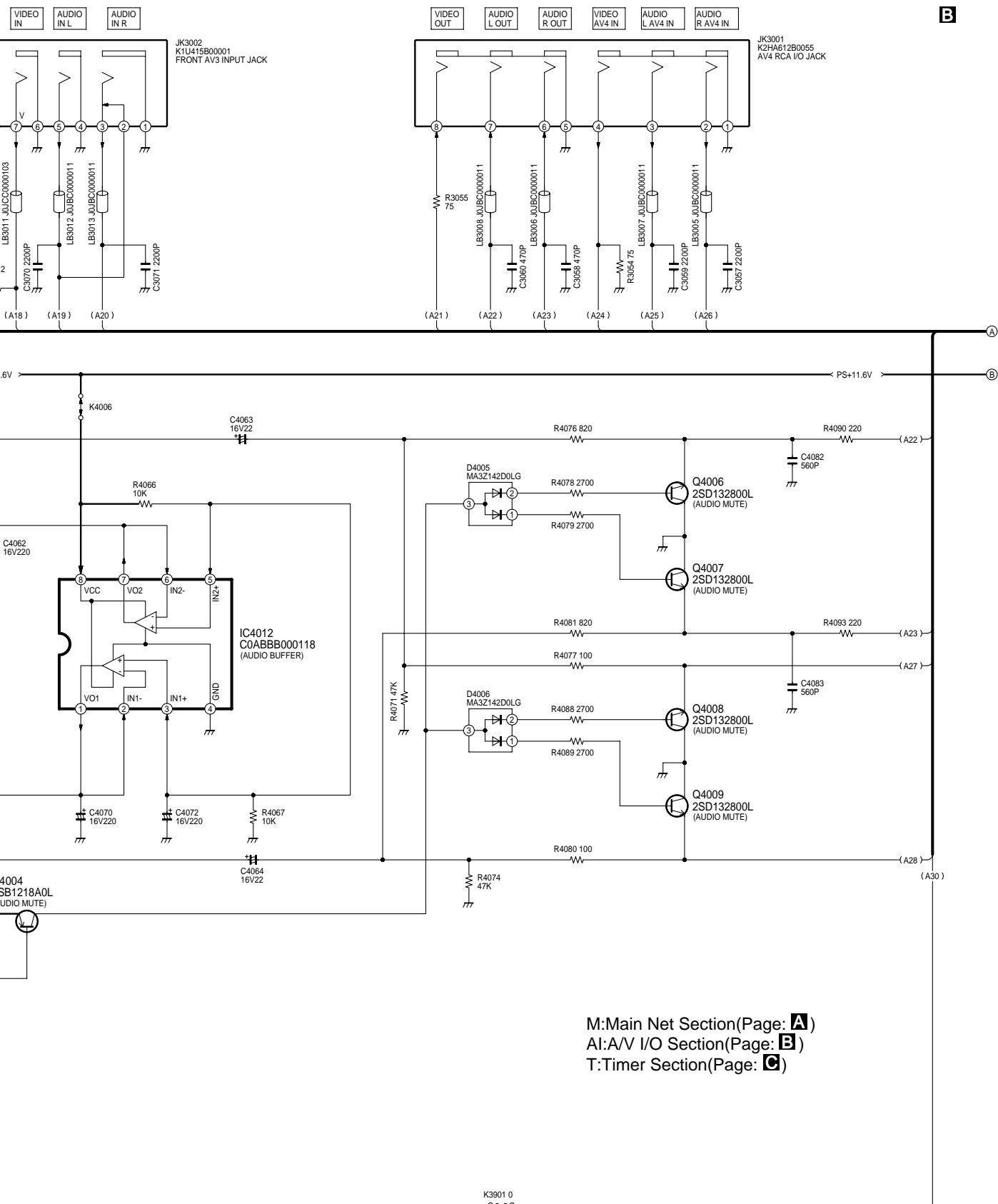


NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

DMR-EH50GN
Main Net Section(Main P.C.B.(1/3))
Schematic Diagram(M)

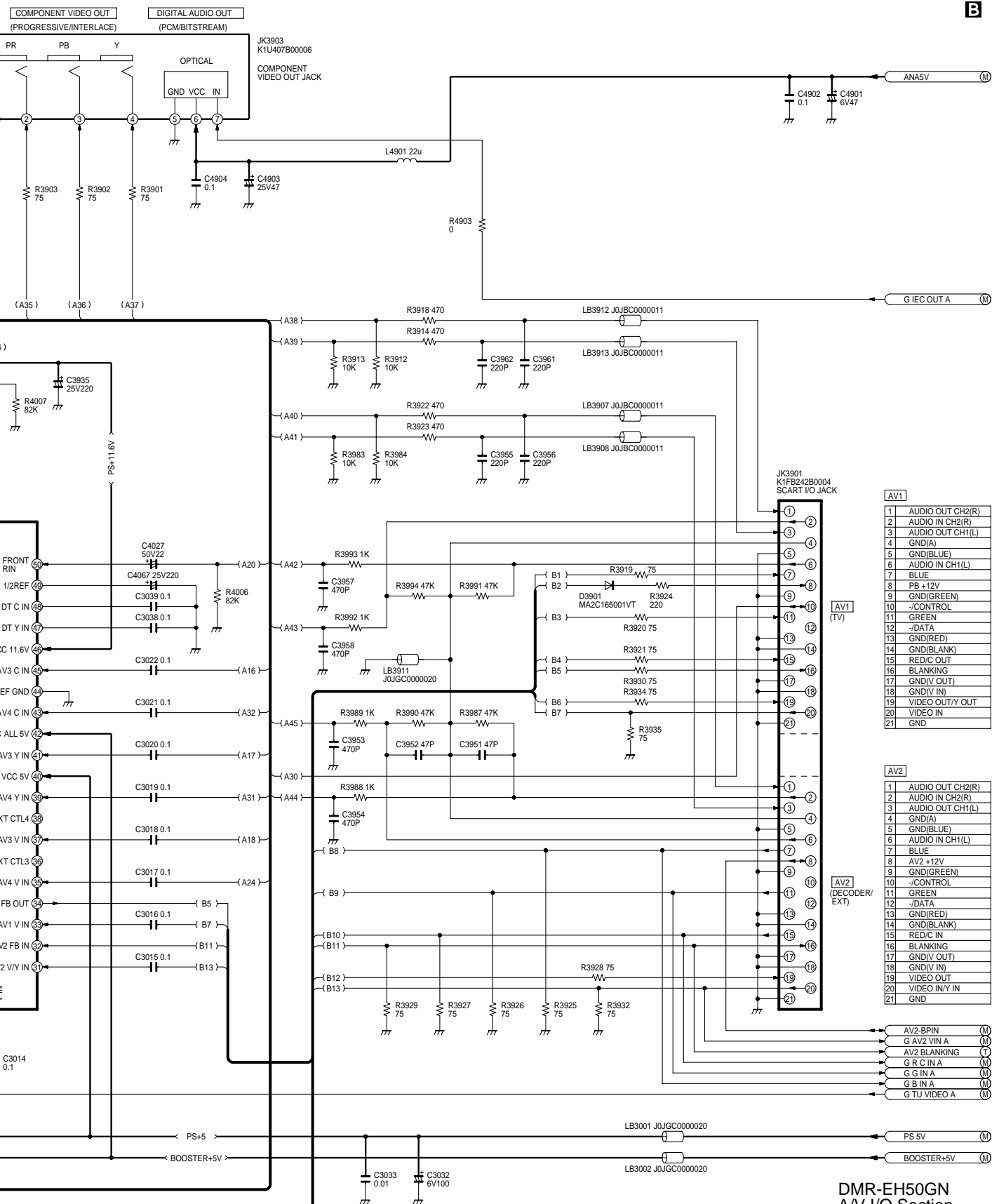
18.4. A/V I/O Section (Main P.C.B. (2/3)) Schematic Diagram (AI)





M:Main Net Section(Page: **A**)
 AI:A/V I/O Section(Page: **B**)
 T:Timer Section(Page: **C**)

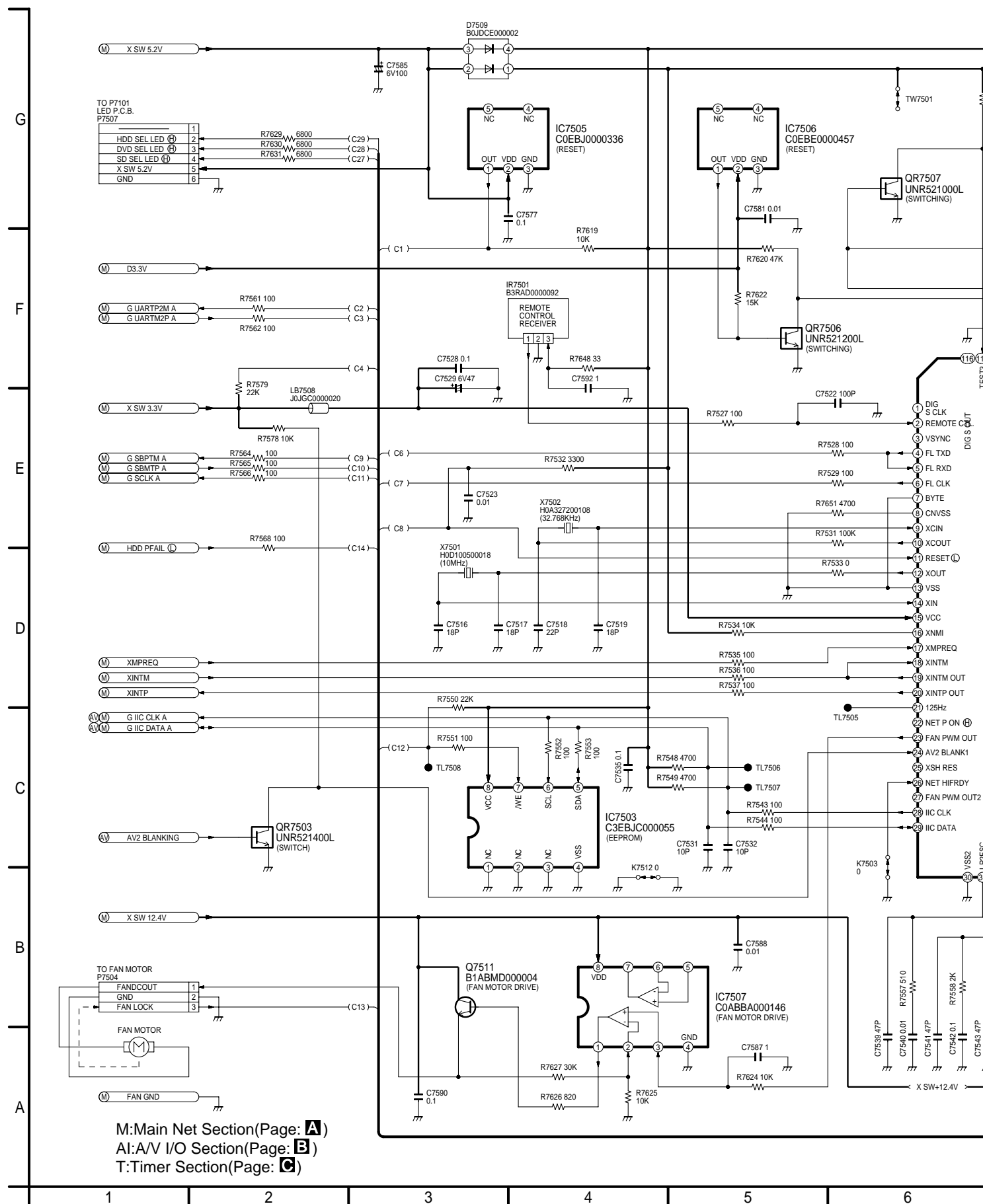
DMR-EH50GN
 A/V I/O Section(Main P.C.B.(2/3))
 Schematic Diagram(AI)



NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST, AND MAY BE
SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-EH50GN
A/V I/O Section
(Main P.C.B.(2/3))
Schematic Diagram(AI)

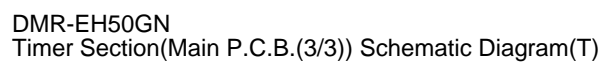
18.5. Timer Section (Main P.C.B. (3/3)) Schematic Diagram (T)



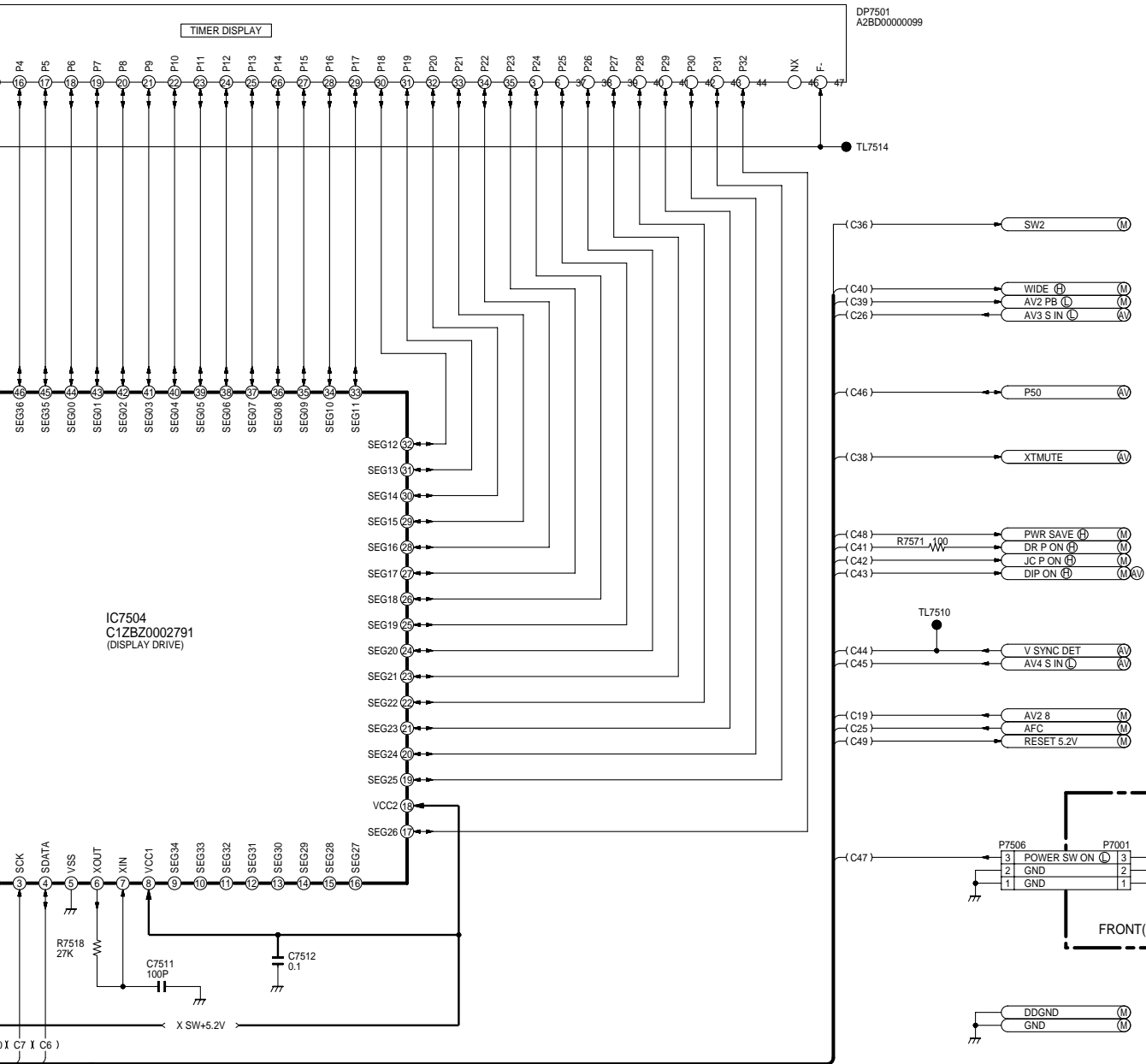
M:Main Net Section(Page: **A**)

AI:A/V I/O Section(Page: **B**)

T:Timer Section(Page: **C**)



C



M:Main Net Section(Page: **A**)
 AI:A/V I/O Section(Page: **B**)
 T:Timer Section(Page: **C**)

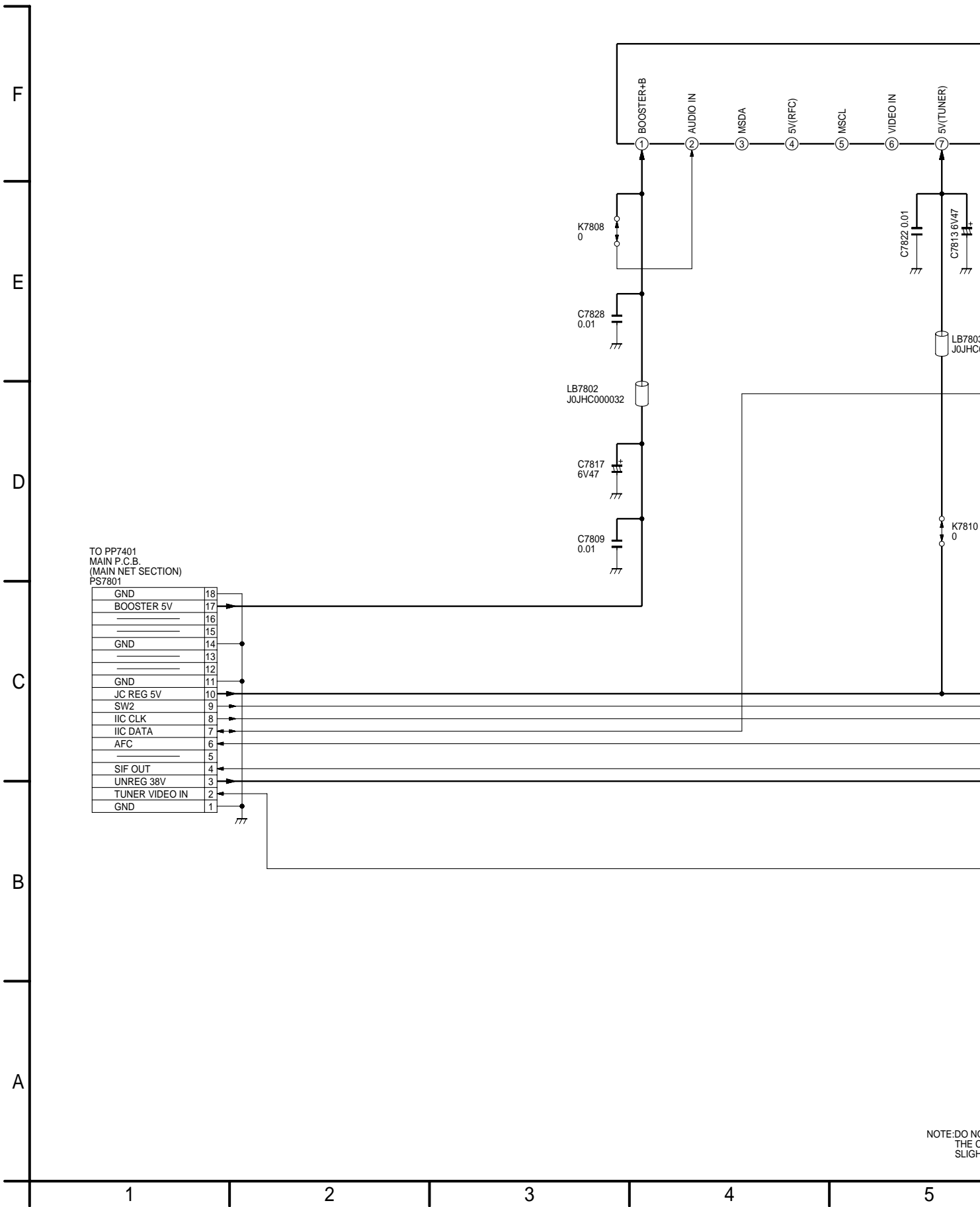
DMR-EH50GN
 Timer Section(Main P.C.B.(3/3))
 Schematic Diagram(T)

THE MARK HAVE THE SPECIAL CHARACTERISTICS
 ANY OF THESE COMPONENTS.ONLY THE SAME TYPE.

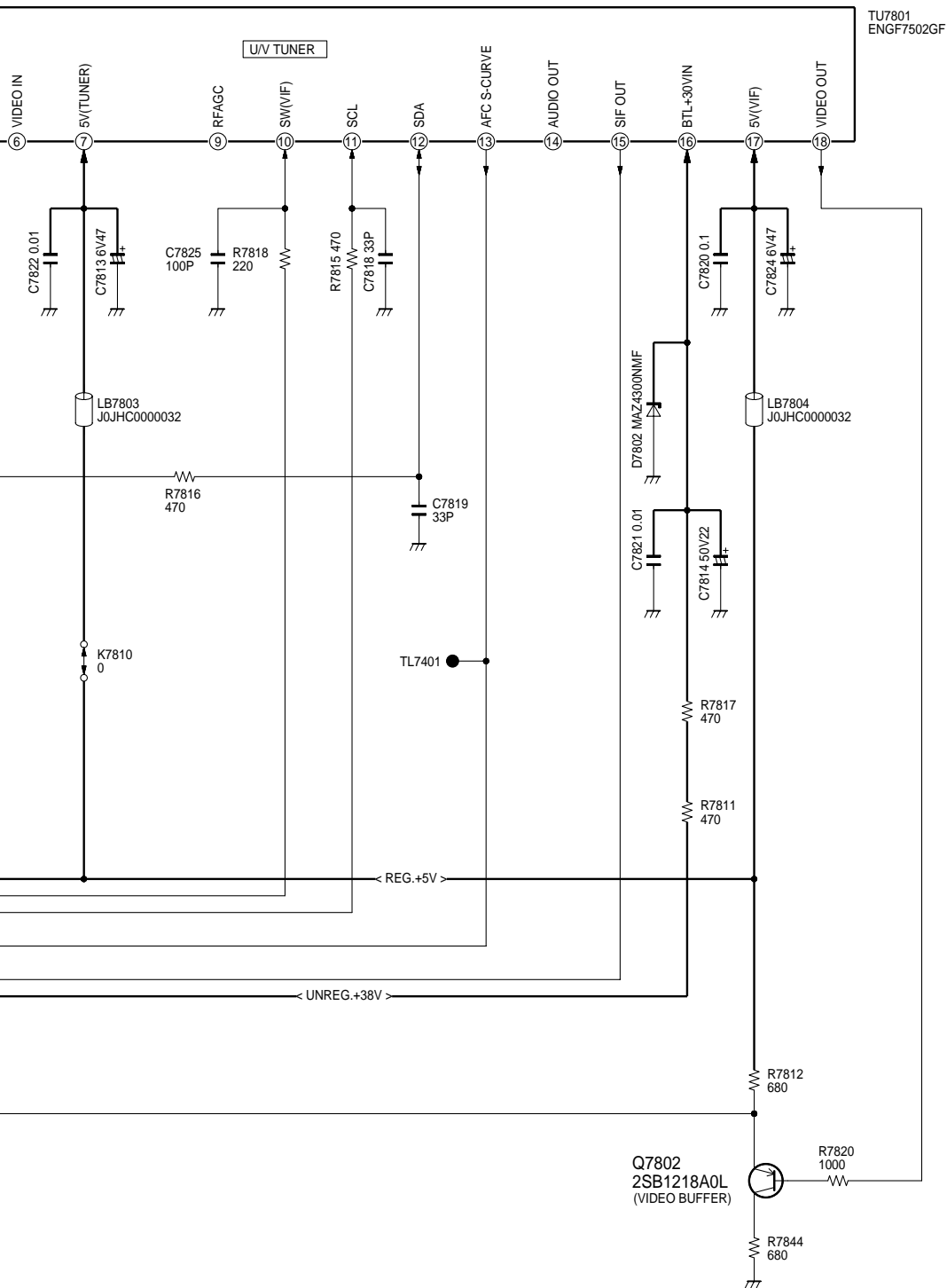
NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR
 ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

17 18 19 20 21 22

18.6. Tuner Pack Schematic Diagram



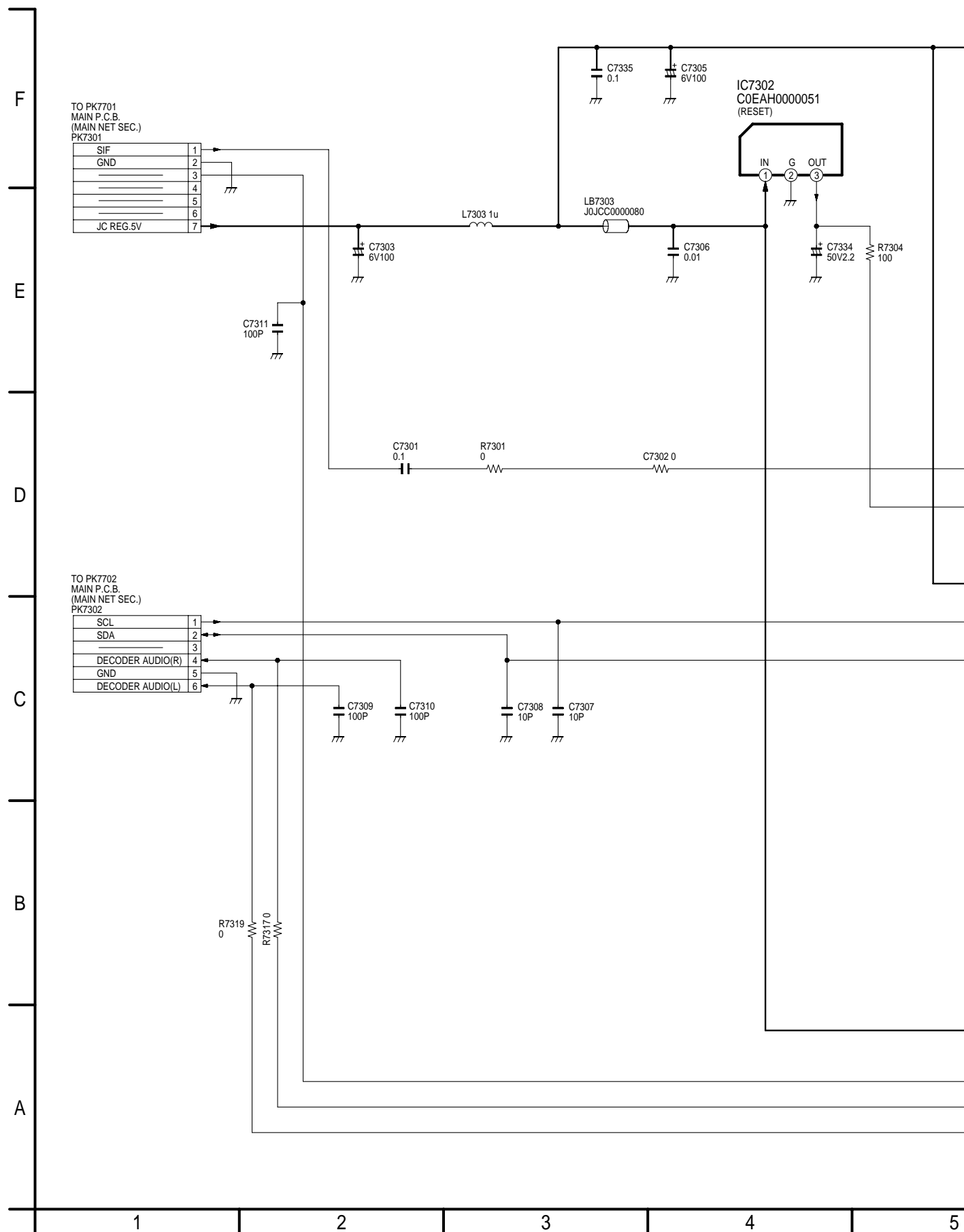
NOTE:DO NOT
THE C
SLIGH

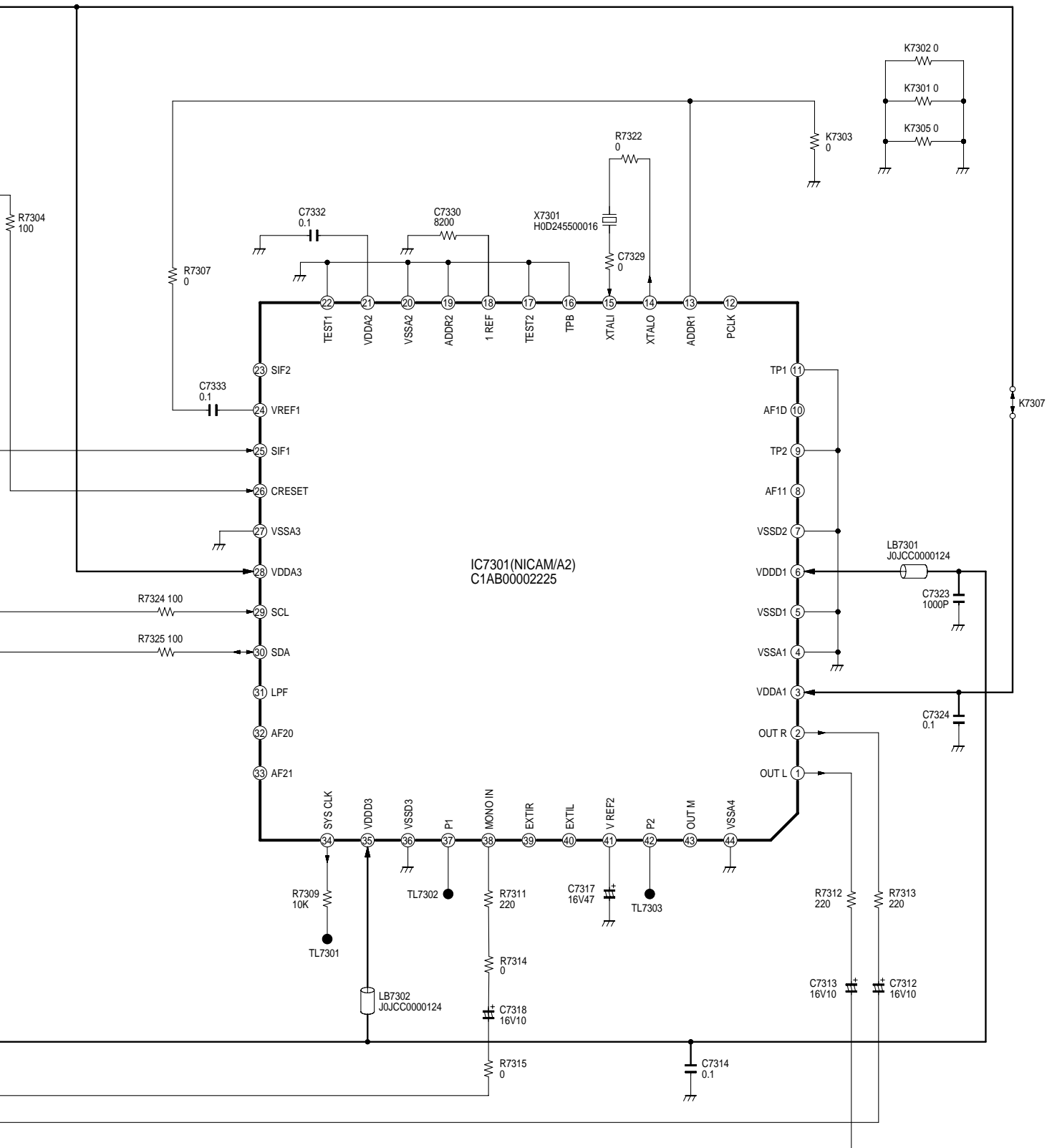


NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST, AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-EH50GN
Tuner Pack
Schematic Diagram

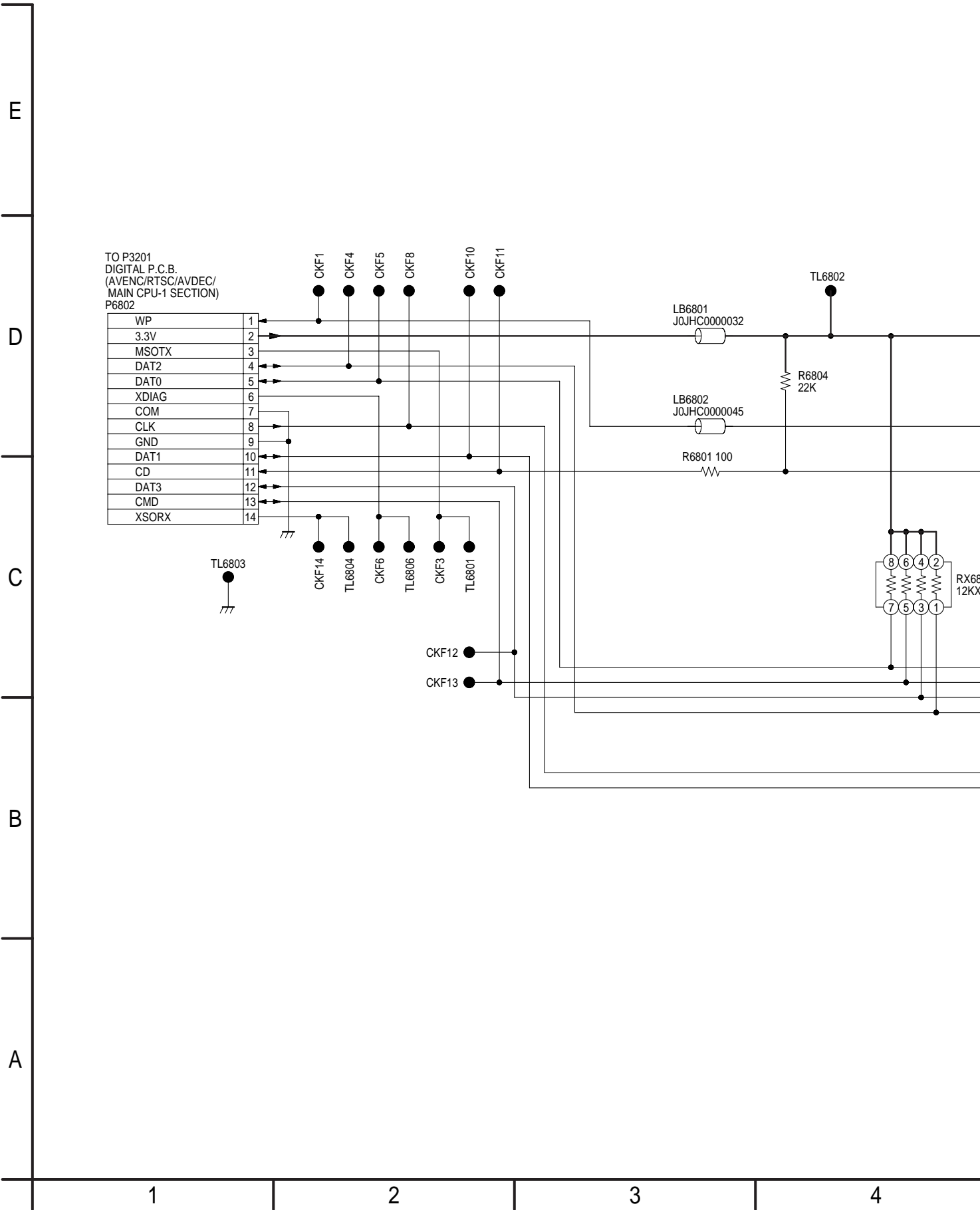
18.7. Nicam Decoder Schematic Diagram

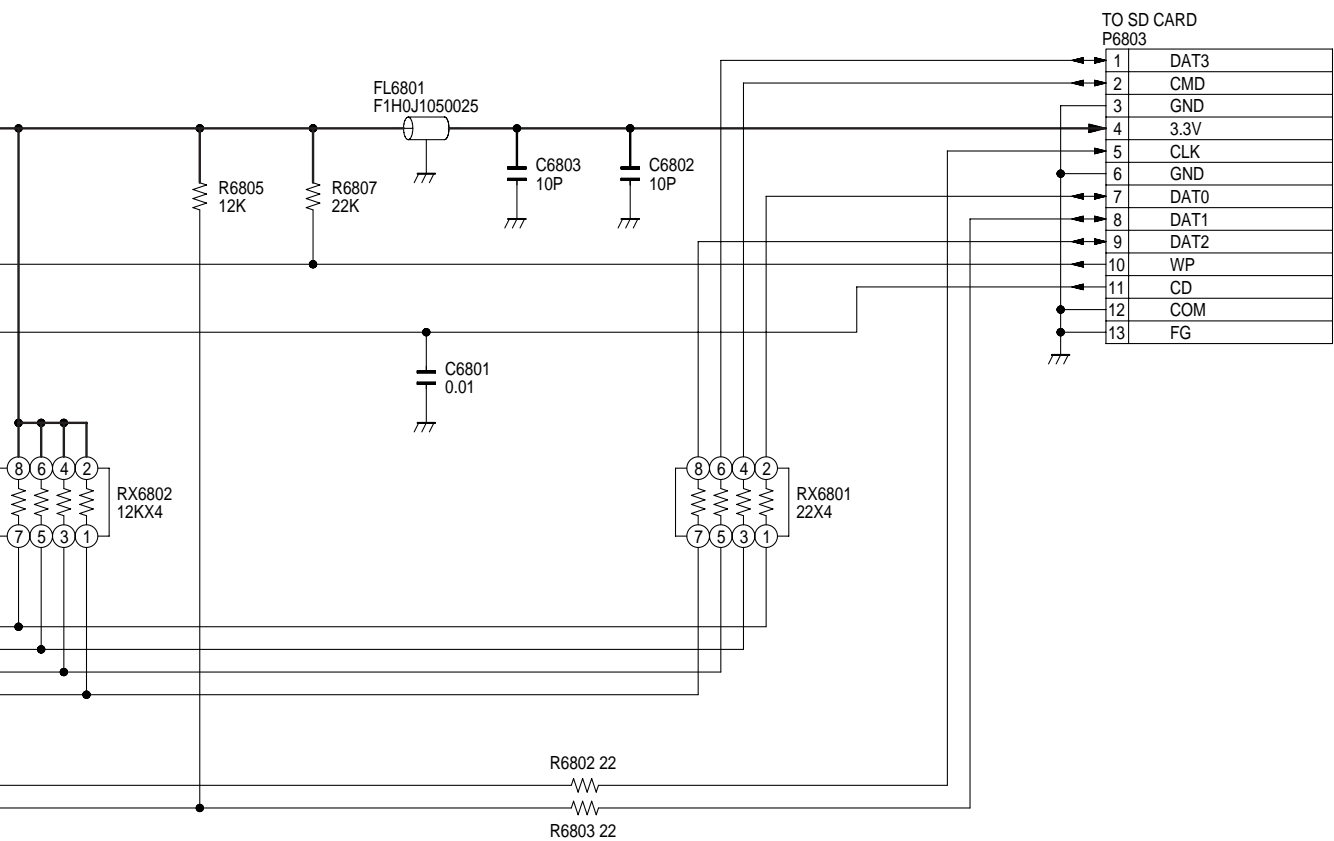




DMR-EH50GN
Nicam Decoder
Schematic Diagram

18.8. SD Card Schematic Diagram





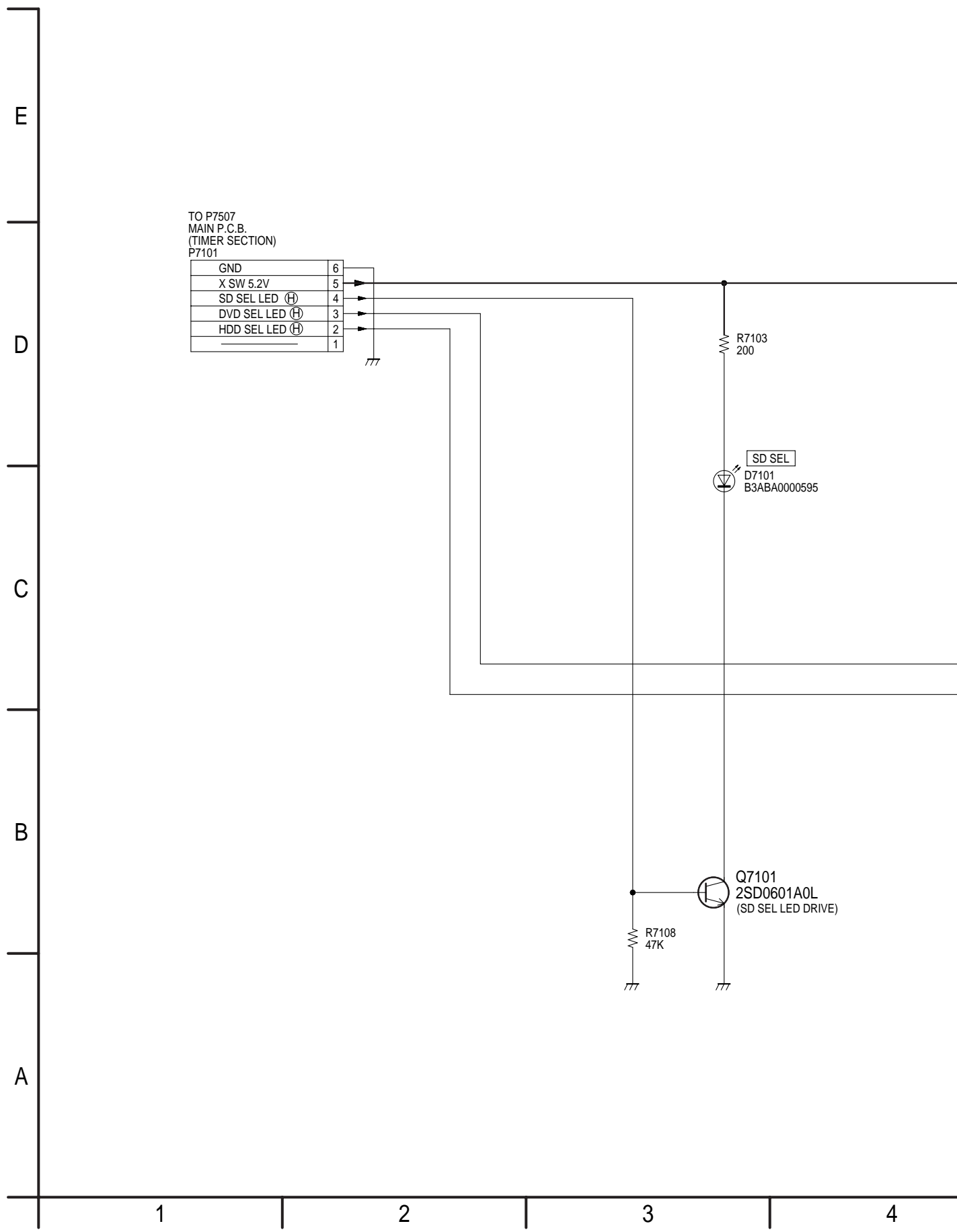
NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

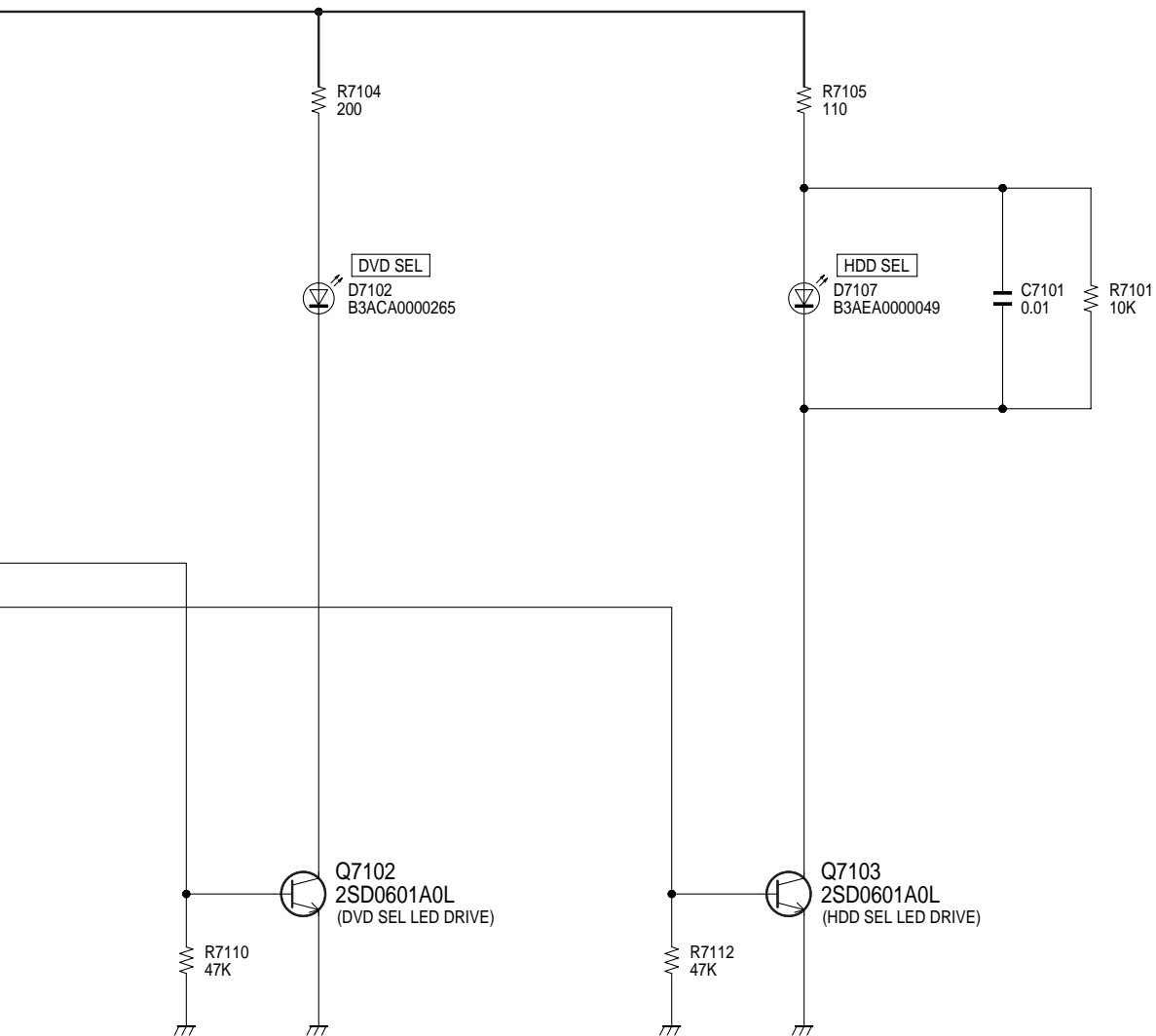
DMR-EH50GN
SD Card Schematic Diagram





18.9. LED Schematic Diagram





NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

DMR-EH50GN
LED Schematic Diagram

4

5

6

7

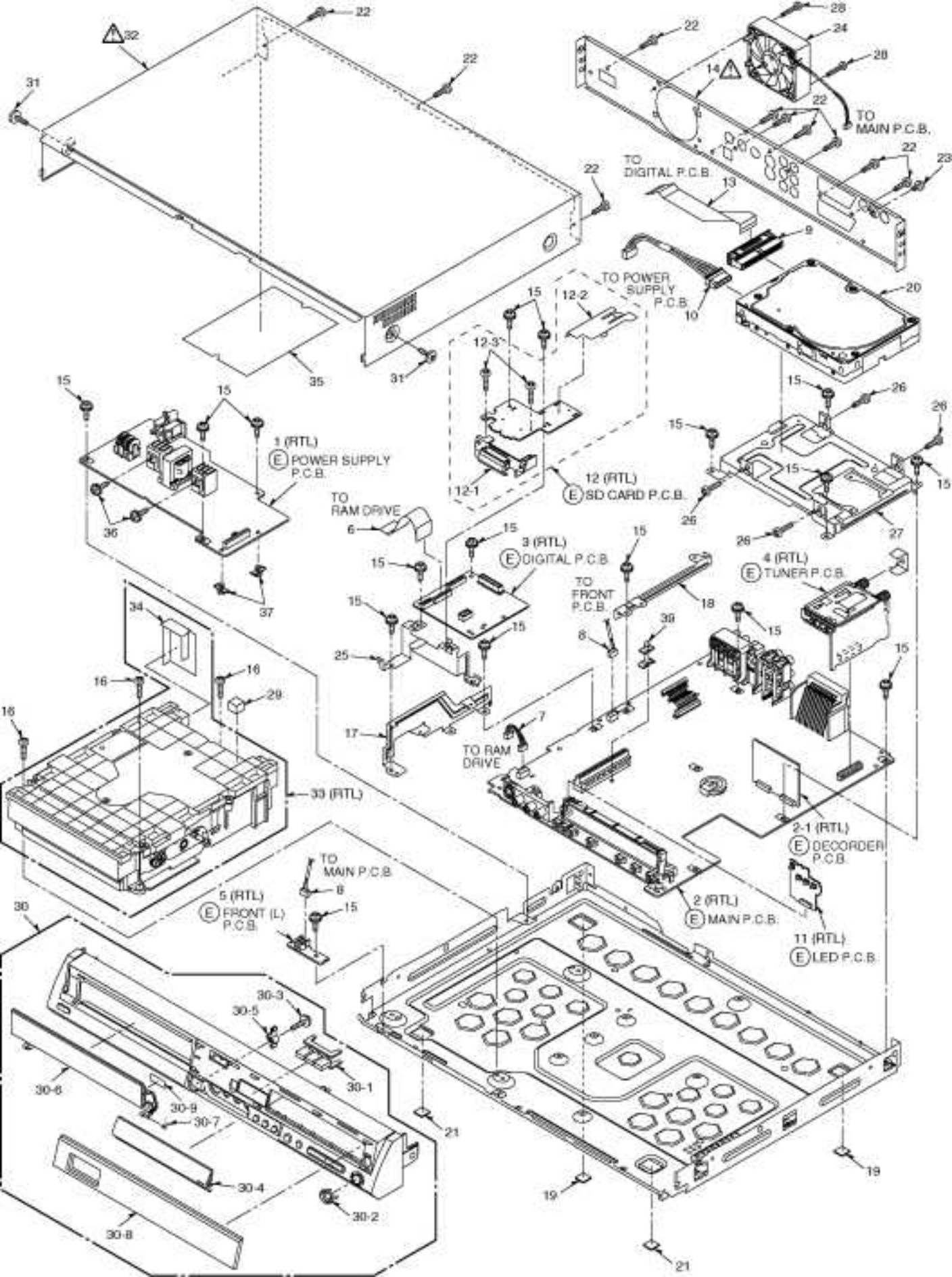
20 Exploded Views

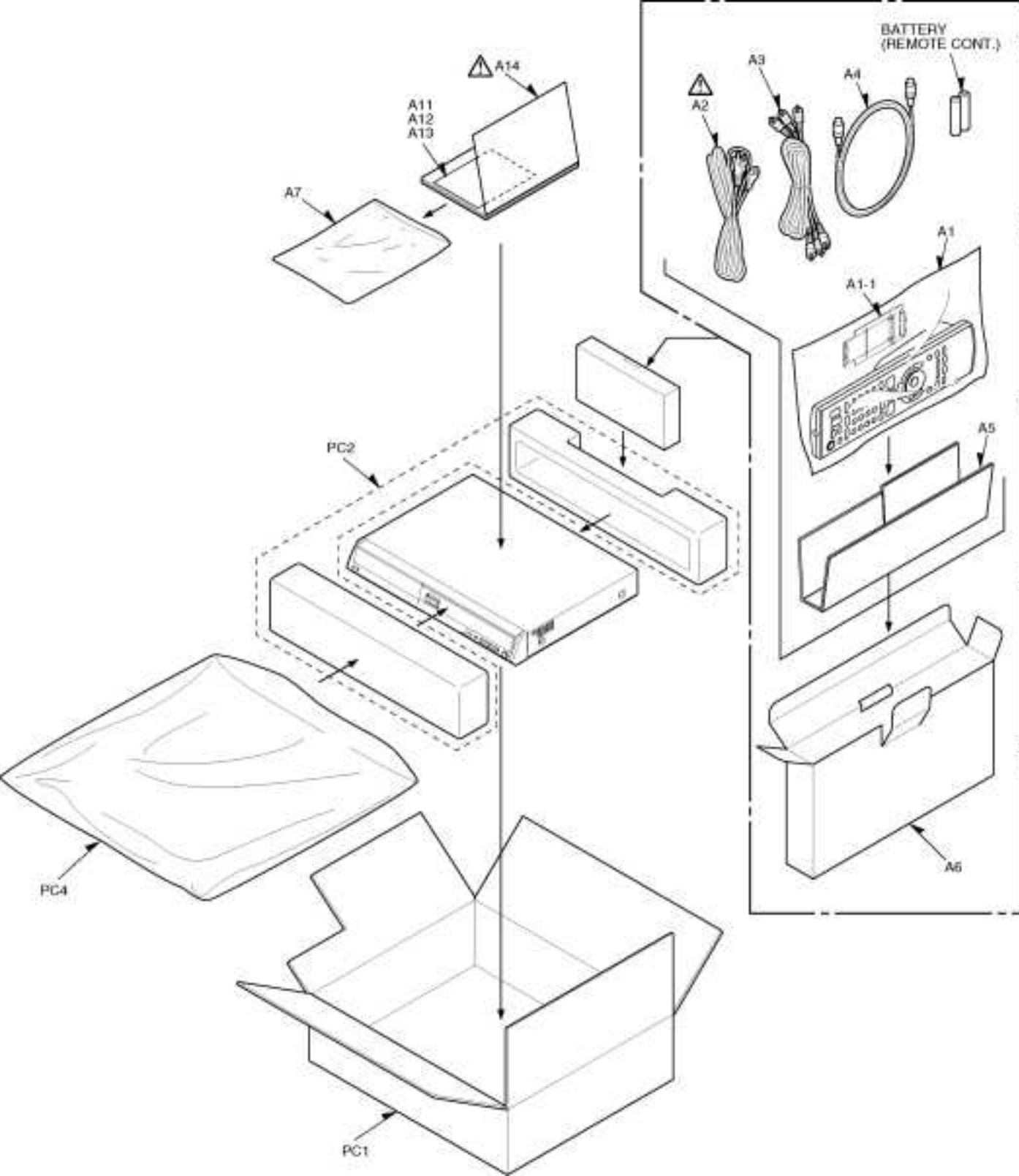
20.1 Casing Parts & Mechanism Section



20.2 Packing & Accessories Section







21 Replacement Parts List

Notes:

*Important safety notice:

Components identified by  mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

*Warning: This product uses a laser diode. Refer to caution statements.

*Capacity values are in microfarads (μF) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

*The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

*“(IA)”, mark in Remarks indicates language of instruction manual. [(IA):] All parts are supplied by S.P.C..

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	01	CASING/ACCESSORY/PACKING	1	(RTL)
1	VEP01961A	POWER SUPPLY P.C.B.	1	(RTL)
2	VEP79107K	MAIN P.C.B.	1	(RTL)
2-1	VEP07A51A	DECORDER P.C.B.	1	(RTL)
3	RFKBEH50GN	DIGITAL P.C.B.	1	(RTL)
4	VEP07A77C	TUNER P.C.B.	1	(RTL)
5	VEP70115A	FRONT(L) P.C.B.	1	(RTL)
6	VWJ1775	FFC(40P)	1	
7	VEE1A60	WIRE WITH CONNECTOR(4P)	1	
8	VEE1B41	WIRE WITH CONNECTOR(2P)	1	
9	K1MZ40Z00002	HDD CONNECTOR	1	
10	VEE1B60	HDD CABLE(4P)	1	
11	VEP70116B	LED P.C.B.	1	(RTL)
12	VEP73121D	SD CARD P.C.B.	1	(RTL)
12-1	RYQ0556A-S	CARD HOLDER ASS'Y	1	
12-2	RMV0298	FFC HOLDER	1	
12-3	XTN2+8GFJ	SCREW	2	
13	VWJ1780	FFC(40P)	1	
14	RGR0354F-D	REAR PANEL	1	
15	RHD30111-3	SCREW	17	
16	RHD30115-3	SCREW	3	
17	RMA1909	DIGITAL ANGLE	1	
18	RMA1913	POWER P.C.B. ANGLE	1	
19	RKA0177-K	LEG CUSHION	2	
20	RFKV0047HDK	HDD 80GB	1	
21	RKA0166-T	LEG RUBBER	2	
22	VHD0690-1	SCREW	10	
23	XSN3+4FJK	SCREW	1	
24	L6FAKCCE0003	SMALL DC FAN MOTORS	1	
25	RMA1910	SD CARD ANGLE	1	
26	RHD32001	SCREW	4	
27	RMN0823	HDD BRACKET	1	
28	XTB3+25JFJK	SCREW	2	
29	RMX0325	MECHA SPACER	1	
30	RYP1270D-S	FRONT PANEL ASS'Y1	1	
30-1	RGL0678-Q	PANEL LIGHT	1	
30-2	RGK1885-S	REC BUTTON RING	1	
30-3	RHD26045	SCREW	1	
30-4	RKF0729E-S	PANEL DOOR	1	

30-5	RMR1698-S	SHAFT HOLDER	1	
30-6	RKF0728A-K	TRAY DOOR	1	
30-7	VMB3410	TRAY SPRING	1	
30-8	RGK1886A-Q	FL ORNAMENT	1	
30-9	RMX0302	DOOR DAMPER	1	
31	RHD30113	SCREW	2	
32	RKM0532A-S	TOP CASE	1	▲
33	RFKNVXY1872	RAM DRIVE UNIT	1	(RTL)
34	RMV0302	BARRIER	1	
35	RMV0301	BARRIER	1	
36	XYN3+F8FJ	SCREW	2	
37	RMX0323	PCB SPACER	2	
39	VMD4943	PCB ADAPTOR	1	
A1	EUR7729KF0	REMOTE CONTROL ASS'Y	1	
A1-1	UR77EC2903A	BATTERY COVER	1	
A2	K2CJ2DA00011	AC CORD	1	▲
A3	K2KA6CA00001	AV CORD	1	
A4	VJA1089	RF COAXIAL CABLE	1	K1TWACC00001
A5	RPQ1594	PAD	1	
A6	RPQF0254	ACCESSORY CASE	1	
A7	RPF0378	POLYETHYLENE BAG(F.B.)	1	
A11	RQCA1395	SD CARD CAUTION SHEET	1	
A12	RQCB1141	CCP CARD	1	
A13	RQCC2705	DVD MEDIA SHEET	1	
A14	RQT8157-L	OPERATING INSTRUCTIONS	1	(IA) ▲
PC1	RPG7568	PACKING CASE	1	
PC2	RPN1798	CUSHION	1	
PC4	VPF0505	POLYETHYLENE BAG(UNIT)	1	
■	02	VEP79107K	1	(MAIN P.C.B.)
C1501	ECJ1VB1E223K	25V 0.022U	1	
C1503	ECA1AHG221	10V 220U	1	
C1504	EEUFC1E101S	25V 100U	1	
C1505	ECJ2FB0J106K	6.3V 10U	1	
C1506,07	F2A1A470A388	10V 47U	2	
C1508	ECJ1VB1H103K	50V 0.01U	1	
C1509	ECJ1VB0J105K	6.3V 1U	1	
C1510	ECJ1VB1A105K	10V 1U	1	
C1511,12	ECJ1VB0J105K	6.3V 1U	2	
C1515	F2A1A470A388	10V 47U	1	
C1517	ECJ1VC1H471J	50V 470P	1	
C1518	F2A0J681A550	6.3V 680U	1	
C1520	ECJ1VB1A105K	10V 1U	1	
C1521	ECJ1VB0J105K	6.3V 1U	1	
C1522	ECJ1XC1H331J	50V 330P	1	
C1526	F2A1A470A388	10V 47U	1	
C1527	ECJ2FB0J106K	6.3V 10U	1	
C1535	ECJ1VB1A105K	10V 1U	1	
C1536	ECJ2FB0J106K	6.3V 10U	1	
C1538	ECJ1VB1A105K	10V 1U	1	
C1539	ECJ1VB0J105K	6.3V 1U	1	
C1540	ECJ1VB1H103K	50V 0.01U	1	
C3001	ECJ1XB1C104K	16V 0.1U	1	
C3002	ECJ1VB1H103K	50V 0.01U	1	
C3003,04	ECJ1XB1C104K	16V 0.1U	2	
C3005,06	ECA0JM471G	6.3V 470U	2	
C3007	F2A1A4710038	10V 470U	1	
C3008	F2A1A1010072	10V 100U	1	
C3009	F2A1A4710038	10V 470U	1	

C3010	F2A1A1010072	10V 100U	1	
C3011	ECJ1XB1C104K	16V 0.1U	1	
C3012	F2A1A4710038	10V 470U	1	
C3013	F2A1A1010072	10V 100U	1	
C3014-22	ECJ1XB1C104K	16V 0.1U	9	
C3025	ECJ1XB1C104K	16V 0.1U	1	
C3026	ECJ1VB0J105K	6.3V 1U	1	
C3027	ECJ1XB1C104K	16V 0.1U	1	
C3028	ECEA1HKA4R7	50V 4.7U	1	
C3029	ECJ1XB1C104K	16V 0.1U	1	
C3030	ECEA1HKA4R7	50V 4.7U	1	
C3031	ECJ1VB1H103K	50V 0.01U	1	
C3032	ECEA0JKS101	6.3V 100U	1	
C3033,34	ECJ1VB1H103K	50V 0.01U	2	
C3035	ECEA0JKS101	6.3V 100U	1	
C3038,39	ECJ1XB1C104K	16V 0.1U	2	
C3057	ECJ1VB1H222K	50V 2200P	1	
C3058	ECJ1VC1H471J	50V 470P	1	
C3059	ECJ1VB1H222K	50V 2200P	1	
C3060	ECJ1VC1H471J	50V 470P	1	
C3064	ECJ1XB1C104K	16V 0.1U	1	
C3070,71	ECJ1VB1H222K	50V 2200P	2	
C3072	ECJ1XB1C104K	16V 0.1U	1	
C3910,11	F2A1V100A534	35V 10U	2	
C3914,15	F2A1H100A236	50V 10U	2	
C3916,17	F2A1H1R0A236	50V 1U	2	
C3918,19	F2A1H100A236	50V 10U	2	
C3928	F2A1V100A534	35V 10U	1	
C3929	F2A1H1R0A638	50V 1U	1	
C3935	F2A1E2210050	25V 220U	1	
C3951,52	ECJ1XC1H470J	50V 47P	2	
C3953,54	ECJ1VC1H471J	50V 470P	2	
C3955,56	ECJ1VC1H221J	50V 220P	2	
C3957,58	ECJ1VC1H471J	50V 470P	2	
C3961,62	ECJ1VC1H221J	50V 220P	2	
C4003	ECJ1VB0J105K	6.3V 1U	1	
C4005	F2A1H2200032	50V 22U	1	
C4006	F2A1V100A534	35V 10U	1	
C4008	EEUFC1E101S	25V 100U	1	
C4019	F2A1V100A534	35V 10U	1	
C4021	F2A1V100A534	35V 10U	1	
C4023	F2A1V100A534	35V 10U	1	
C4024	EEUFC1E101S	25V 100U	1	
C4025	F2A1V100A534	35V 10U	1	
C4027	F2A1H2200032	50V 22U	1	
C4028	F2A1V100A534	35V 10U	1	
C4033,34	F2A1C220A709	16V 22U	2	
C4055	ECJ1VF1C104Z	16V 0.1U	1	
C4056	F2A1C471A628	16V 470U	1	
C4057	ECUV1H330JCG	50V 33P	1	ECJ2VC1H330J
C4059	ECQV1H104JL	50V 0.1U	1	
C4060	ECUV1H330JCG	50V 33P	1	ECJ2VC1H330J
C4061	ECJ1VF1C104Z	16V 0.1U	1	
C4062	F2A1C221A637	16V 220U	1	
C4063,64	F2A1C220A709	16V 22U	2	
C4065	ECJ1VF1C104Z	16V 0.1U	1	
C4067	F2A1E2210050	25V 220U	1	
C4070	F2A1C221A637	16V 220U	1	
C4072	F2A1C221A637	16V 220U	1	


C4077	ECJ1VF1C104Z	16V 0.1U	1	
C4082,83	ECJ2VC1H561J	50V 560P	2	
C4092	F2A1C101A637	16V 100U	1	
C4901	F2A0J470A599	6.3V 47U	1	
C4902	ECJ1VF1C104Z	16V 0.1U	1	
C4903	F2A1E4700048	25V 47U	1	
C4904	ECJ1VF1C104Z	16V 0.1U	1	
C7301	ECJ1VF1C104Z	16V 0.1U	1	
C7302	ERJ3GEY0R00	1/10W 0	1	
C7303	ECEA0JKS101	6.3V 100U	1	
C7305	ECEA0JKS101	6.3V 100U	1	
C7306	ECJ1VF1H103Z	50V 0.01U	1	
C7307,08	ECJ1VC1H100C	50V 10P	2	
C7309-11	ECJ1XC1H101J	50V 100P	3	
C7312,13	ECEA1CKS100	16V 10U	2	
C7314	ECJ1VF1C104Z	16V 0.1U	1	
C7317	ECEA1CKA470	16V 47U	1	
C7318	ECEA1CKS100	16V 10U	1	
C7323	ECJ1XC1H102J	50V 1000P	1	
C7324	ECJ1VF1C104Z	16V 0.1U	1	
C7329	ERJ3GEY0R00	1/10W 0	1	
C7330	ERJ3GEYJ822	1/10W 8.2K	1	
C7332	ECJ1VF1C104Z	16V 0.1U	1	
C7333	ECJ1XB1C104K	16V 0.1U	1	
C7334	ECEA1HKS2R2	50V 2.2U	1	
C7335	ECJ1VF1C104Z	16V 0.1U	1	
C7401	F2A1C471A628	16V 470U	1	
C7402	ECJ1VC1H471J	50V 470P	1	
C7403	F2A0J470A599	6.3V 47U	1	
C7404	ECJ1VB0J105K	6.3V 1U	1	
C7405	ECJ1XB1C104K	16V 0.1U	1	
C7406	ECJ1VB1A105K	10V 1U	1	
C7407,08	ECJ1XB1C104K	16V 0.1U	2	
C7416	F2A1E4700048	25V 47U	1	
C7427	ECJ1VB1H222K	50V 2200P	1	
C7439	ECJ1XB1C104K	16V 0.1U	1	
C7447,48	ECJ1VB0J105K	6.3V 1U	2	
C7501	ECJ2YB0J475K	6.3V 4.7U	1	
C7502	ECJ1XC1H101J	50V 100P	1	
C7503	ECJ2YB0J475K	6.3V 4.7U	1	
C7504,05	ECJ1XB1C104K	16V 0.1U	2	
C7507	ECJ1VF1C104Z	16V 0.1U	1	
C7510	ECJ1XB1C104K	16V 0.1U	1	
C7511	ECJ1XC1H101J	50V 100P	1	
C7512	ECJ1VF1C104Z	16V 0.1U	1	
C7516,17	ECJ1VC1H180J	50V 18P	2	
C7518	ECJ1XC1H220J	50V 22P	1	
C7519	ECJ1VC1H180J	50V 18P	1	
C7520	ECJ1XB1C104K	16V 0.1U	1	
C7522	ECJ1XC1H101J	50V 100P	1	
C7523	ECJ1VB1H103K	50V 0.01U	1	
C7524	ECJ1XB1C104K	16V 0.1U	1	
C7528	ECJ1VF1C104Z	16V 0.1U	1	
C7529	ECEA0JKS470	6.3V 47U	1	
C7531,32	ECJ1VC1H100C	50V 10P	2	
C7533	ECEA0JKS470	6.3V 47U	1	
C7534	ECJ1VB1H103K	50V 0.01U	1	
C7535	ECJ1VF1C104Z	16V 0.1U	1	
C7539	ECJ1XC1H470J	50V 47P	1	

C7540	ECJ1VB1H103K	50V 0.01U	1	
C7541	ECJ1XC1H470J	50V 47P	1	
C7542	ECJ1XB1C104K	16V 0.1U	1	
C7543	ECJ1XC1H470J	50V 47P	1	
C7544	ECJ1XB1C104K	16V 0.1U	1	
C7546,47	ECJ1VB0J105K	6.3V 1U	2	
C7550	ECEA0JKS470	6.3V 47U	1	
C7551	ECJ1XB1C104K	16V 0.1U	1	
C7552,53	ECJ1VC1H221J	50V 220P	2	
C7554,55	ECJ1VB1H103K	50V 0.01U	2	
C7565	F2A1E221A586	25V 220U	1	
C7569	ECQB1H222KF	50V 2200P	1	
C7570	F2A1V470A533	35V 47U	1	
C7571	F2A1H2200032	50V 22U	1	
C7572	ECA1AHG221	10V 220U	1	
C7573	F2A1H2200032	50V 22U	1	
C7577	ECJ1XB1C104K	16V 0.1U	1	
C7578,79	ECEA0JKS470	6.3V 47U	2	
C7581	ECJ1VB1H103K	50V 0.01U	1	
C7584	F4D55473A013	CAPACITOR	1	
C7585	ECEA0JKS101	6.3V 100U	1	
C7587	ECJ1VB0J105K	6.3V 1U	1	
C7588	ECJ1VB1H103K	50V 0.01U	1	
C7590	ECJ1VF1C104Z	16V 0.1U	1	
C7592	ECJ1VF1A105Z	10V 1U	1	
D1501	MA165TA5	DIODE	1	MA2C16500E
D3901	MA165TA5	DIODE	1	MA2C16500E
D4005,06	MA3Z142D0RG	DIODE	2	
D7403	MA165TA5	DIODE	1	MA2C16500E
D7501	B0BA03600021	DIODE	1	
D7502	1SS355	DIODE	1	B0ACCK000005
D7504	MAZ4300NLF	DIODE	1	
D7505,06	B0AADM000003	DIODE	2	
D7507	B0AAGM000003	DIODE	1	B0AAGM000007
D7508	MAZ4240NMF	DIODE	1	
D7509	B0JDCE000002	DIODE	1	
DP7501	A2BD00000099	FL DISPLAY TUBE	1	
IC1501	C0CBCDD00006	IC	1	
IC1502	C0CBCBD00018	IC	1	
IC1504	C0CBCYH00003	IC	1	
IC1505	C0CBCBD00018	IC	1	
IC1510	C0CBCDG00006	IC	1	
IC1511	C0CBCDD00008	IC	1	
IC3001	C1AB00002100	IC	1	
IC4009	C0ABBB000216	IC	1	
IC4011	C0DBAHD00013	IC	1	
IC4012	C0ABBB000118	IC	1	
IC7301	C1AB00002225	IC	1	
IC7302	PST7043-T	IC	1	C0EAH0000051
IC7401	C0CBCYG00004	IC	1	
IC7402	C0DBCHD00004	IC	1	
IC7403	C0CBCDD00006	IC	1	
IC7501	C2CBKH000136	IC	1	
IC7502	C0EBE0000504	IC	1	
IC7503	C3EBJC000055	IC	1	
IC7504	C1ZBZ0002791	IC	1	
IC7505	C0EBJ0000336	IC	1	
IC7506	C0EBE0000457	IC	1	







IC7507	C0ABBA000146	IC	1	
IP1501	K5H3022A0013	IC PROTECTOR	1	⚠
IP7501	K5H7512A0010	IC PROTECTOR	1	⚠
IR7501	B3RAD0000092	REMOTE SENSOR	1	
JK3001	K2HA612B0055	JACK,AV4 IN/OUT	1	
JK3002	K1U415B00001	JACK,AV3	1	
JK3003	K2HA210B0002	JACK,S-VIDEO AV4 IN/OUT	1	
JK3901	K1FB242B0004	JACK,AV1/AV2	1	
JK3903	K1U407B00006	JACK,VIDEO/OPTICAL OUT	1	
K3901	ERJ3GEY0R00	1/10W 0	1	
K4002	ERJ6GEY0R00V	1/8W 0	1	
K7301-03	ERJ3GEY0R00	1/10W 0	3	
K7305	ERJ3GEY0R00	1/10W 0	1	
K7405,06	ERJ3GEY0R00	1/10W 0	2	
K7503,04	ERJ3GEY0R00	1/10W 0	2	
K7506,07	ERJ3GEY0R00	1/10W 0	2	
K7512	ERJ3GEY0R00	1/10W 0	1	
L1501	G0A220GA0026	COIL 22UH	1	
L1504	G0A100HA0023	COIL 10UH	1	
L4901	G0C220JA0055	COIL 22UH	1	
L7303	G0C1R0JA0019	COIL 1UH	1	
L7403	G0C2R2JA0019	COIL 2.2UH	1	
L7404	G0A220GA0026	COIL 22UH	1	
L7501	G0C390JA0055	COIL 39UH	1	
LB1503,04	J0JKB0000003	COIL	2	
LB1506	J0JKB0000003	COIL	1	
LB3001-03	J0JGC0000020	COIL	3	
LB3005-08	J0JBC0000011	COIL	4	
LB3009-11	J0JCC0000103	COIL	3	
LB3012,13	J0JBC0000011	COIL	2	
LB3907,08	J0JBC0000011	COIL	2	
LB3911	J0JGC0000020	COIL	1	
LB3912,13	J0JBC0000011	COIL	2	
LB7301,02	J0JCC0000124	COIL	2	
LB7303	J0JCC0000080	COIL	1	
LB7401	J0JGC0000020	COIL	1	
LB7406	J0JHC0000032	COIL	1	
LB7408,09	J0JHC0000032	COIL	2	
LB7414,15	J0JHC0000032	COIL	2	
LB7501	ERJ3GEY0R00	1/10W 0	1	
LB7507,08	J0JGC0000020	COIL	2	
LB7509	VLP0175	COIL	1	J0JCC0000060
LB7510	J0JGC0000020	COIL	1	
LB7515-17	ERJ3GEY0R00	1/10W 0	3	
LB7519	J0JKB0000037	COIL	1	
P1501	K1KA23A00003	CONNECTOR(23P)	1	
P1502	K1KA04A00196	CONNECTOR(4P)	1	
P7402	K1KA88A00002	CONNECTOR(88P)	1	
P7504	K1KA03AA0301	CONNECTOR(3P)	1	
P7506	K1KA03AA0301	CONNECTOR(3P)	1	
P7507	VJP3042G006W	CONNECTOR(MALE) 6P	1	K1KA06A00164
PK7301	VJR0777B007W	CONNECTOR(7P)	1	K1MM07B00002
PK7302	VJR0777B006W	CONNECTOR(6P)	1	K1MM06B00002
PP7401	VJP3042G018W	CONNECTOR(18P)	1	K1KA18A00041
Q4004	2SB1218A	TRANSISTOR	1	
Q4006-09	2SD132800L	TRANSISTOR	4	
Q7401	2SD1819AWL	TRANSISTOR	1	
Q7501	2SB1218A	TRANSISTOR	1	





Q7502	2SD1819AWL	TRANSISTOR	1	
Q7503	2SB1218A	TRANSISTOR	1	
Q7504	2SD1819AWL	TRANSISTOR	1	
Q7506,07	2SD0601ARL	TRANSISTOR	2	
Q7508	2SD1819AWL	TRANSISTOR	1	
Q7510	2SD1994B	TRANSISTOR	1	
Q7511	B1ABMD000004	TRANSISTOR	1	
QR4002-05	UN5211	TRANSISTOR	4	UNR5211
QR7401	UN5213TX	TRANSISTOR	1	UNR521300L
QR7403,04	UN5215TX	TRANSISTOR	2	UNR521500L
QR7503	UN5214TX	TRANSISTOR	1	UNR521400L
QR7506	UN5212TX	TRANSISTOR	1	UNR521200L
QR7507	UN5210TX	TRANSISTOR	1	UNR52100RL
QR7508	UN5214TX	TRANSISTOR	1	UNR521400L
R1503	ERJ3GEYJ332	1/10W 3.3K	1	
R1504	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R1505	ERDS2FJ271	1/4W 270	1	
R1506	ERJ3RBD103	1/16W 10K	1	
R1507	ERJ3RBD152	1/16W 1.5K	1	
R1508	ERJ3RBD153	1/16W 15K	1	
R1511-13	ERDS2FJ271	1/4W 270	3	
R1515	ERDS2FJ271	1/4W 270	1	
R1520	ERJ3GEYJ822	1/10W 8.2K	1	
R3006	ERJ3GEYJ822	1/10W 8.2K	1	
R3007	ERJ3GEYJ330	1/10W 33	1	
R3054-62	ERJ3EKF75R0	1/10W 75	9	
R3901-03	ERJ3GEYF750	1/10W 75	3	
R3912,13	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R3914	ERJ3GEYJ471	1/10W 470	1	
R3918	ERJ3GEYJ471	1/10W 470	1	
R3919-21	ERJ3GEYF750	1/10W 75	3	
R3922,23	ERJ3GEYJ471	1/10W 470	2	
R3924	ERDS2FJ221	1/4W 220	1	
R3925-27	ERJ3GEYF750	1/10W 75	3	
R3928-30	ERJ3EKF75R0	1/10W 75	3	
R3932	ERJ3EKF75R0	1/10W 75	1	
R3934,35	ERJ3EKF75R0	1/10W 75	2	
R3975,76	ERJ3GEYJ101	1/10W 100	2	D0GB101JA002
R3983,84	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R3987	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R3988,89	ERJ3GEYJ102V	1/10W 1K	2	
R3990,91	ERJ3GEYJ473V	1/10W 47K	2	D0GB473JA002
R3992,93	ERJ3GEYJ102V	1/10W 1K	2	
R3994	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R4002	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R4004	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R4006-08	ERJ3GEYJ823	1/10W 82K	3	
R4010,11	ERJ3GEYJ473V	1/10W 47K	2	D0GB473JA002
R4013	ERJ3GEYJ823	1/10W 82K	1	
R4014	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R4017	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R4046,47	D0HB752ZA002	1/10W 7.5K	2	
R4055	JAR0816P123D	1/16W 12K	1	D0HB123ZA002
R4057	JAR0816P123D	1/16W 12K	1	D0HB123ZA002
R4066,67	JAR0816P103D	1/16W 10K	2	D0HB103ZA002
R4071	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R4074	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R4076	ERJ3GEYJ821	1/10W 820	1	
R4077	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002




R4078,79	ERJ3GEYJ272	1/10W 2.7K	2	
R4080	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R4081	ERJ3GEYJ821	1/10W 820	1	
R4088,89	ERJ3GEYJ272	1/10W 2.7K	2	
R4090	ERJ3GEYJ221	1/10W 220	1	
R4093	ERJ3GEYJ221	1/10W 220	1	
R4094	ERJ3GEYJ223	1/10W 22K	1	
R4903	ERJ3GEY0R00	1/10W 0	1	
R7301	ERJ3GEY0R00	1/10W 0	1	
R7304	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R7307	ERJ3GEY0R00	1/10W 0	1	
R7309	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7311	ERJ3GEYJ221	1/10W 220	1	
R7312,13	ERJ3RBD221	1/10W 220	2	
R7314,15	ERJ3GEY0R00	1/10W 0	2	
R7317	ERJ3GEY0R00	1/10W 0	1	
R7319	ERJ3GEY0R00	1/10W 0	1	
R7322	ERJ3GEY0R00	1/10W 0	1	
R7324,25	ERJ3GEYJ101	1/10W 100	2	D0GB101JA002
R7401	ERJ3GEY0R00	1/10W 0	1	
R7402	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7403	ERJ3GEYD153V	1/10W 15K	1	D0HB153ZA002
R7404	ERJ3GEYJ223	1/10W 22K	1	
R7405	ERJ3GEYJ471	1/10W 470	1	
R7406	ERJ3GEYJ474	1/10W 470K	1	
R7407	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7408	ERJ3GEYD153V	1/10W 15K	1	D0HB153ZA002
R7410	ERJ3GEYJ821	1/10W 820	1	
R7421,22	ERJ3GEYJ101	1/10W 100	2	D0GB101JA002
R7438-42	ERJ3GEYJ220	1/10W 22	5	
R7444	ERJ3RED300	1/16W 3	1	
R7445	ERJ3RBD682	1/16W 6.8K	1	ERJ3RBD682V
R7446	ERJ3RBD202	1/16W 2K	1	
R7501	ERJ3GEYJ102V	1/10W 1K	1	
R7502	ERJ3GEYJ392	1/10W 3.9K	1	
R7503	ERJ3GEYJ104	1/10W 100K	1	
R7504	ERJ3GEYJ102V	1/10W 1K	1	
R7505	ERJ3GEYD153V	1/10W 15K	1	D0HB153ZA002
R7506	ERJ3GEYJ104	1/10W 100K	1	
R7507	ERJ3GEYG152	1/10W 1.5K	1	
R7508	ERJ3GEYG562	1/10W 5.6K	1	
R7510	ERJ3GEY0R00	1/10W 0	1	
R7518	ERJ3RBD273	1/16W 27K	1	
R7527-29	ERJ3GEYJ101	1/10W 100	3	D0GB101JA002
R7531	ERJ3GEYJ104	1/10W 100K	1	
R7532	ERJ3GEYJ332	1/10W 3.3K	1	
R7533	ERJ3GEY0R00	1/10W 0	1	
R7534	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7535-37	ERJ3GEYJ101	1/10W 100	3	D0GB101JA002
R7543,44	ERJ3GEYJ101	1/10W 100	2	D0GB101JA002
R7548,49	ERJ3GEYJ472	1/10W 4.7K	2	
R7550	ERJ3GEYJ223	1/10W 22K	1	
R7551-53	ERJ3GEYJ101	1/10W 100	3	D0GB101JA002
R7557	ERJ3GEYJ511	1/10W 510	1	
R7558,59	ERJ3GEYJ202	1/10W 2K	2	
R7560	ERJ3GEYJ472	1/10W 4.7K	1	
R7561-66	ERJ3GEYJ101	1/10W 100	6	D0GB101JA002
R7568	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R7570	ERJ3GEYJ392	1/10W 3.9K	1	

R7571	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R7574	ERJ3GEYJ223	1/10W 22K	1	
R7575	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R7576	ERJ3GEYJ102V	1/10W 1K	1	
R7577,78	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R7579	ERJ3GEYJ223	1/10W 22K	1	
R7582	ERJ3GEYJ104	1/10W 100K	1	
R7583	ERJ3GEYJ472	1/10W 4.7K	1	
R7584	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R7585	ERJ3GEYJ225	1/10W 2.2K	1	
R7586	ERJ3GEYJ273	1/10W 27K	1	
R7587	ERJ3GEYJ224	1/10W 220K	1	
R7588	ERJ3GEYJ104	1/10W 100K	1	
R7589	ERJ3GEYJ221	1/10W 220	1	
R7590	ERJ3GEYJ104	1/10W 100K	1	
R7597-99	ERJ3GEYJ822	1/10W 8.2K	3	
R7600	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7601	ERJ3GEYJ102V	1/10W 1K	1	
R7606	ERJ3GEYG393V	1/10W 39K	1	
R7607	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R7608	ERJ3GEYG433	1/10W 43K	1	
R7612	ERJ3GEYJ332	1/10W 3.3K	1	
R7614	ERJ3GEYJ470	1/10W 47	1	
R7615,16	ERJ3GEYJ473V	1/10W 47K	2	D0GB473JA002
R7617	ERDS2FJ331	1/4W 330	1	
R7619	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7620	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R7621	ERJ3GEYJ104	1/10W 100K	1	
R7622	ERJ3GEYD153V	1/10W 15K	1	D0HB153ZA002
R7623	ERJ3GEYJ181V	1/10W 180	1	
R7624,25	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R7626	ERJ3GEYJ821	1/10W 820	1	
R7627	ERJ3GEYJ303	1/10W 30K	1	
R7628	ERJ3GEYJ223	1/10W 22K	1	
R7629-31	ERJ3GEYJ682	1/10W 6.8K	3	
R7639,40	ERJ3GEYJ272	1/10W 2.7K	2	
R7641	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R7642,43	ERJ3GEYJ562	1/10W 5.6K	2	
R7644	ERJ3GEYJ222	1/10W 2.2K	1	
R7648	ERDS2FJ330	1/4W 33	1	
R7649	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R7651	ERJ3GEYJ472	1/10W 4.7K	1	
R7652,53	ERJ3GEYJ101	1/10W 100	2	D0GB101JA002
R7655	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
S7501	EVQPC105K	SWITCH,EXT LINK	1	
S7502	EVQPC105K	SWITCH,CH DOWN	1	
S7503	EVQPC105K	SWITCH,CH UP	1	
S7504	EVQPC105K	SWITCH,OPEN/CLOSE	1	
S7505	EVQPC105K	SWITCH,SELECT	1	
S7506	EVQPC105K	SWITCH,STOP	1	
S7507	EVQPC105K	SWITCH,PLAY	1	
S7508	EVQPC105K	SWITCH,REC	1	
T7501	G4D1C0000003	TRANSFORMER	1	
W7 02	ERJ3GEY0R00	1/10W 0	1	
W701	ERJ3GEY0R00	1/10W 0	1	
W702-05	ERJ6GEY0R00V	1/8W 0	4	
W706-09	ERJ3GEY0R00	1/10W 0	4	
W711-28	ERJ3GEY0R00	1/10W 0	18	

W729	ERJ6GEY0R00V	1/8W 0	1	
W730,31	ERJ3GEY0R00	1/10W 0	2	
X7301	H0D245500016	CRYSTAL OSCILLATOR	1	
X7501	H0D100500018	CRYSTAL OSCILLATOR	1	
X7502	H0A327200108	CRYSTAL OSCILLATOR	1	
■	03	VEP07A51A	1	(DECORDER P.C.B.)
C7301	ECJ1VF1C104Z	16V 0.1U	1	
C7302	ERJ3GEY0R00	1/10W 0	1	
C7303	ECEA0JKS101	6.3V 100U	1	
C7305	ECEA0JKS101	6.3V 100U	1	
C7306	ECJ1VF1H103Z	50V 0.01U	1	
C7307,08	ECJ1VC1H100C	50V 10P	2	
C7309-11	ECJ1XC1H101J	50V 100P	3	
C7312,13	ECEA1CKS100	16V 10U	2	
C7314	ECJ1VF1C104Z	16V 0.1U	1	
C7317	ECEA1CKA470	16V 47U	1	
C7318	ECEA1CKS100	16V 10U	1	
C7323	ECJ1XC1H102J	50V 1000P	1	
C7324	ECJ1VF1C104Z	16V 0.1U	1	
C7329	ERJ3GEY0R00	1/10W 0	1	
C7330	ERJ3GEYJ822	1/10W 8.2K	1	
C7332	ECJ1VF1C104Z	16V 0.1U	1	
C7333	ECJ1XB1C104K	16V 0.1U	1	
C7334	ECEA1HKS2R2	50V 2.2U	1	
C7335	ECJ1VF1C104Z	16V 0.1U	1	
IC7301	TDA9874AH	IC	1	C1AB00001404
IC7302	PST7043-T	IC	1	C0EAH0000051
K7301-03	ERJ3GEY0R00	1/10W 0	3	
K7305	ERJ3GEY0R00	1/10W 0	1	
L7303	G0C1R0JA0019	COIL 1UH	1	
LB7301,02	J0JCC0000124	COIL	2	
LB7303	J0JCC0000080	COIL	1	
PK7301	VJR0777B007W	CONNECTOR(7P)	1	K1MM07B00002
PK7302	VJR0777B006W	CONNECTOR(6P)	1	K1MM06B00002
R7301	ERJ3GEY0R00	1/10W 0	1	
R7304	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R7307	ERJ3GEY0R00	1/10W 0	1	
R7309	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7311	ERJ3GEYJ221	1/10W 220	1	
R7312,13	ERJ3RBD221	1/10W 220	2	
R7314,15	ERJ3GEY0R00	1/10W 0	2	
R7317	ERJ3GEY0R00	1/10W 0	1	
R7319	ERJ3GEY0R00	1/10W 0	1	
R7322	ERJ3GEY0R00	1/10W 0	1	
R7324,25	ERJ3GEYJ101	1/10W 100	2	D0GB101JA002
W6,W7	ERJ3GEY0R00	1/10W 0	2	
X7301	H0D245500016	CRYSTAL OSCILLATOR	1	
■	04	VEP07A77C	1	(TUNER P.C.B.)
C7809	ECJ1VB1H103K	50V 0.01U	1	
C7813	F2A0J470A599	6.3V 47U	1	
C7814	F2A1H2200032	50V 22U	1	
C7817	F2A0J470A599	6.3V 47U	1	
C7818,19	ECJ1VC1H330J	50V 33P	2	
C7820	ECJ1XB1C104K	16V 0.1U	1	
C7821,22	ECJ1VB1H103K	50V 0.01U	2	
C7824	F2A0J470A599	6.3V 47U	1	
C7825	ECJ1XC1H101J	50V 100P	1	
C7828	ECJ1VB1H103K	50V 0.01U	1	

D7802	MA4300N-M	DIODE	1	MAZ4300NM
K7808	ERJ3GEY0R00	1/10W 0	1	
K7810	ERJ3GEY0R00	1/10W 0	1	
LB7802-04	J0JHC0000032	COIL	3	
PS7801	VJS3042F018W	CONNECTOR(18P)	1	K1KB18B00012
Q7802	2SB1218A	TRANSISTOR	1	
R7811	ERG2SJ471E	2W 470	1	
R7812	ERJ6GEYG681	1/8W 680	1	
R7815,16	ERJ3GEYJ471	1/10W 470	2	
R7817	ERG2SJ471E	2W 470	1	
R7818	ERJ3GEYJ221	1/10W 220	1	
R7820	ERJ3GEYJ102V	1/10W 1K	1	
R7844	ERJ6GEYG681	1/8W 680	1	
TU7801	ENG7502GF	TV TUNERS	1	
W501	ERJ3GEY0R00	1/10W 0	1	
W502	ERJ6GEY0R00V	1/8W 0	1	
W503,04	ERJ3GEY0R00	1/10W 0	2	
W505	ERJ6GEY0R00V	1/8W 0	1	
W506,07	ERJ3GEY0R00	1/10W 0	2	
W508	ERJ6GEY0R00V	1/8W 0	1	
W509,10	ERJ3GEY0R00	1/10W 0	2	
W511-15	ERJ6GEY0R00V	1/8W 0	5	
W516,17	ERJ3GEY0R00	1/10W 0	2	
W518	ERJ6GEY0R00V	1/8W 0	1	
W519-21	ERJ3GEY0R00	1/10W 0	3	
W522	ERJ6GEY0R00V	1/8W 0	1	
W523	ERJ3GEY0R00	1/10W 0	1	
W524-28	ERJ6GEY0R00V	1/8W 0	5	
W529	ERJ3GEY0R00	1/10W 0	1	
W530	ERJ6GEY0R00V	1/8W 0	1	
W531-35	ERJ3GEY0R00	1/10W 0	5	
W536	ERJ8GEY0R00V	1/4W 0	1	
W537	ERJ3GEY0R00	1/10W 0	1	
W538,39	ERJ6GEY0R00V	1/8W 0	2	
W540,41	ERJ3GEY0R00	1/10W 0	2	
W542-46	ERJ6GEY0R00V	1/8W 0	5	
W547-49	ERJ3GEY0R00	1/10W 0	3	
W550	ERJ8GEY0R00V	1/4W 0	1	
	06	VEP01961A	1	(POWER SUPPLY P.C.B.)
C1120	ECQU2A223MLC	0.022U	1	
C1121	ECQU2A683MLC	0.068U	1	
C1122,23	F1B2G1020002	1000P	2	
C1125	F1B2G1020002	1000P	1	
C1143	ECEC2GG680FZ	400V 68U	1	
C1150	EEUFM1V680B	35V 68U	1	
C1151	F1B3D102A011	2V 1000P	1	
C1152	ECJ2XC1H331J	16V 330P	1	
C1153	ECUM1H222KBN	50V 2200P	1	
C1154	ECJ2XB1H102K	50V 1000P	1	ECJ2VB1H102K
C1200	ECJ2VB1E104K	25V 0.1U	1	
C1201	ECJ2VB1E473K	25V 0.047U	1	
C1270,71	F2A1C182A621	16V 1800U	2	
C1272	F2A1C102A625	16V 1000U	1	
C1273	EEUFM1C121	25V 120U	1	
C1274	ECJ2VB1E104K	25V 0.1U	1	
C1400	EEUFM1E221	25V 220U	1	
C1401	ECJ2XF1C105Z	16V 1U	1	

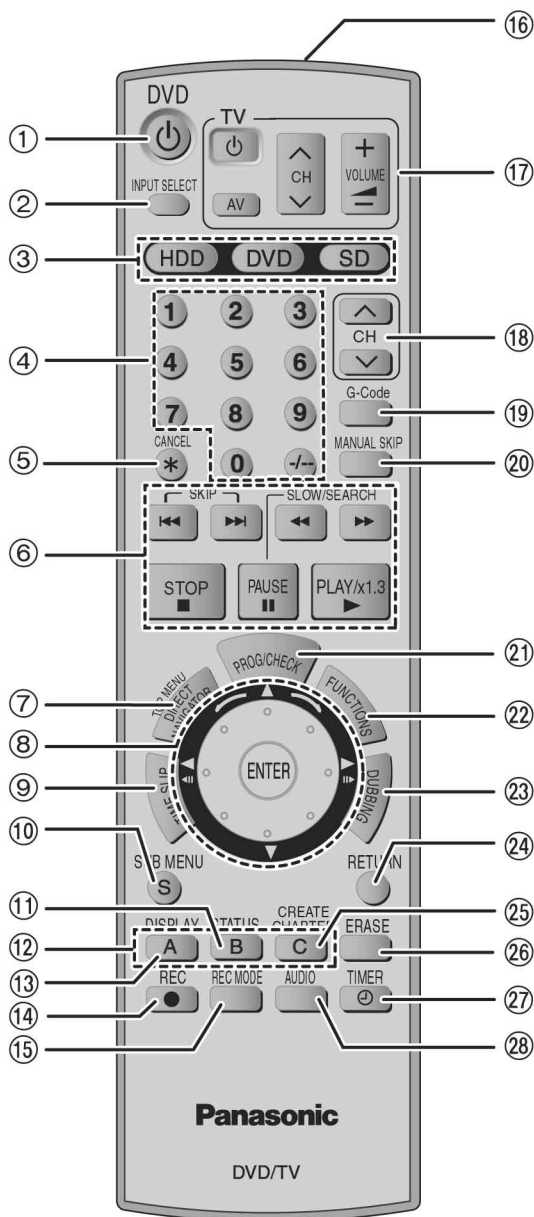
C1402	ECJ2VB1H103K	50V 0.01U	1	
C1403	ECUV1H391JCG	50V 390P	1	
C1404	ECJ2VB1H472K	50V 4700P	1	
C1405	ECJ2XB1H102K	50V 1000P	1	ECJ2VB1H102K
C1406	F2A0J681A550	6.3V 680U	1	
C1407	EEUFM1E221	25V 220U	1	
C1408,09	ECJ2VB1E104K	25V 0.1U	2	
C1410	ECJ2VB1H223K	50V 0.023U	1	
C1411	ECJ2XC1H181J	16V 180P	1	
C1412	ECJ2VB1H103K	50V 0.01U	1	
C1413	F2A1A4710038	10V 470U	1	
C1421	ECJ2VB1E104K	25V 0.1U	1	
C1513	F2A1A4710038	10V 470U	1	
C1514	ECJ2VB1H103K	50V 0.01U	1	
C1601	EEUFM1E221	25V 220U	1	
C1602-04	ECJ2VB1E104K	25V 0.1U	3	
C1605	ECJ2XC1H181J	16V 180P	1	
C1606	ECJ2VB1H103K	50V 0.01U	1	
C1607	F2A1A681A539	10V 680U	1	
C1608	ECJ2VB1E104K	25V 0.1U	1	
C1701	EEUFM1E221	25V 220U	1	
C1702,03	ECJ1XB1C104K	16V 0.1U	2	
C1704	ECJ1VB1H103K	50V 0.01U	1	
C1705	ECJ1XC1H121J	50V 120P	1	
C1706	ECJ1VB1H103K	50V 0.01U	1	
C1707	F2A0J681A550	6.3V 680U	1	
C1800	F2A1E4700048	25V 47U	1	
D1140	B0EDKT000009	DIODE	1	
D1151	B0HAGM000006	DIODE	1	
D1152	MAZ4100NMF	DIODE	1	
D1155	MAZ73000BC	DIODE	1	
D1156	MA165TA5	DIODE	1	MA2C16500E
D1157	AP01C	DIODE	1	B0HADV000010
D1270	B0JBSG000010	DIODE	1	
D1400	B0JCPE000015	DIODE	1	
D1401	B0JCPD000021	DIODE	1	
D1601	B0JCPD000021	DIODE	1	
D1701	B0JCPE000015	DIODE	1	
D1800	MA2J11100L	DIODE	1	
F1101	K5D202BK0005	FUSE	1	
IC1150	C0DACZH00017	IC	1	
IC1200	C0DAEMB00003	IC	1	
IC1400	C0DAAJG00007	IC	1	
IC1401	C0DBAKG00005	IC	1	
IC1501	C0EBJ0000143	IC	1	
IC1601	C0DBAKG00007	IC	1	
IC1701	C0DBAKG00005	IC	1	
IP1401	K5H3022A0013	IC PROTECTOR	1	
IP1601	K5H3022A0013	IC PROTECTOR	1	
L1120,21	G0B233D00001	COIL	2	
L1270	G0A100H00025	COIL	1	
L1400	G0A100HA0023	COIL 10UH	1	
L1401	G0A330ZA0041	COIL 33UH	1	
L1402	G0A150ZA0041	COIL 15UH	1	
L1503	G0A100HA0023	COIL 10UH	1	
L1601	G0A150ZA0041	COIL 15UH	1	
L1701	G0A220ZA0041	COIL 22UH	1	
LB1400	J0JHC0000048	FILTER	1	

LB1600	J0JHC0000048	FILTER	1	
LB1700	J0JHC0000048	FILTER	1	
P1101	K2AA2H000007	AC INLET	1	
P1102	K1KB23A00004	CONNECTOR(FEMALE) 23P	1	
P1103	K1KA04AA0190	CONNECTOR(4P)	1	
Q1200	B3PBA0000237	TRANSISTOR	1	
Q1270	B1DHED000008	TRANSISTOR	1	
Q1400	B1DHDD000022	TRANSISTOR	1	
Q1600	B1DHDD000022	TRANSISTOR	1	
Q1700	B1DDCC000009	TRANSISTOR	1	
QR1301-04	UNR221300L	TRANSISTOR	4	
QR1800	UN2113	TRANSISTOR	1	UNR2113
QR1801	UNR221300L	TRANSISTOR	1	
R1150	ERJ6GEYJ180	1/8W 18	1	
R1151	ERJ6GEYG682	1/8W 6.8K	1	
R1152	ERJ6GEYJ103V	1/8W 10K	1	
R1153	ERJ6GEYJ180	1/8W 18	1	
R1154	ERJ6GEYG912V	1/8W 9.1K	1	
R1155	ERJ6GEYG471	1/8W 470	1	
R1156	ERJ6ENF1602	RESISTOR	1	
R1157	ERJ6GEYG511	1/8W 510	1	
R1158	ERX2SJR22P	22	1	
R1200	ERJ6GEYG122	1/8W 1.2K	1	
R1201	ERJ6ENF8201	RESISTOR	1	
R1205	ERJ6GEYJ224	1/8W 220K	1	
R1206	ERJ6GEYG242V	1/8W 2.4K	1	
R1207	ERJ6GEYJ103V	1/8W 10K	1	
R1208	ERJ6GEYJ222V	1/8W 2.2K	1	
R1209,10	ERJ6GEYJ102V	1/8W 1K	2	
R1270,71	ERJ6GEYJ472V	1/8W 4.7K	2	
R1311	ERJ6GEYJ472V	1/8W 4.7K	1	
R1401	ERJ6GEYJ104V	1/8W 100K	1	
R1402	ERJ6RBD821	1/10W 820	1	
R1404	ERJ6RBD102V	1/10W 1K	1	
R1405	ERJ6GEYJ513V	1/8W 51K	1	
R1406	D1BFR0270001	RESISTOR	1	
R1407	ERJ6RBD272	1/10W 2.7K	1	
R1409	ERJ6RBD472V	1/10W 4.7K	1	
R1410	ERJ6RBD151	1/10W 150	1	
R1411	ERJ6RBD123V	1/10W 12K	1	
R1518	ERJ6GEYJ103V	1/8W 10K	1	
R1601	D1BFR0150001	15	1	
R1602	ERJ6GEYJ513V	1/8W 51K	1	
R1603	ERJ6RBD242	1/10W 2.4K	1	
R1604	ERJ6RBD153	1/10W 15K	1	
R1605	ERJ6RBD272	1/10W 2.7K	1	
R1701	ERJL14KJ47MU	47	1	D1BFR047A010
R1702	ERJ3GEYJ333	1/10W 33K	1	
R1703	ERJ3GEY0R00	1/10W 0	1	
R1704	ERJ3RBD103	1/16W 10K	1	
R1705	ERJ3RBD472	1/16W 4.7K	1	
R1800	ERJ6GEYJ471	1/8W 470	1	
R1801	ERJ6GEYJ104V	1/8W 100K	1	
R1802	ERJ6GEYJ472V	1/8W 4.7K	1	
R1803	ERJ6GEYJ103V	1/8W 10K	1	
T1150	ETS29AZ2G6AC	TRANSFORMER	1	
VA1110	ERZVA5V471	SURGE ABSORBER	1	

ZA1103,04	EYF52BCY	FUSE HOLDER	2	
■	07	VEP70115A	1	(FRONT(L)P.C.B.)
P7001	K1KA03AA0301	CONNECTOR(3P)	1	
S7001	EVQPC105K	SWITCH,POWER	1	
■	08	VEP70116B	1	(LED P.C.B.)
C7101	ECJ1VB1H103K	50V 0.01U	1	
D7101	B3ABA0000595	DIODE	1	
D7102	B3ACA0000265	DIODE	1	
D7107	B3AEA0000049	DIODE	1	
P7101	VJS3042F006W	CONNECTOR(6P)	1	K1KB06B00024
Q7101-03	2SD0601ARL	TRANSISTOR	3	
R7101	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R7103,04	ERJ6GEYJ201V	1/8W 200	2	
R7105	ERJ6GEYJ111V	1/10W 100	1	
R7108	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R7110	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R7112	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
■	09	VEP73121D	1	(SD CARD P.C.B.)
C6801	ECJ1VB1H103K	50V 0.01U	1	
C6802,03	ECJ2FB0J106K	6.3V 10U	2	
FL6801	F1H0J1050025	FILTER	1	
LB6801	J0JHC0000032	COIL	1	
LB6802	J0JHC0000045	COIL	1	
P6802	K1KB14A00073	CONNECTOR(14P)	1	
P6803	K1NA09E00027	CONNECTOR(9P)	1	
R6801	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R6802,03	ERJ3GEYJ220	1/10W 22	2	
R6804	ERJ3GEYJ223	1/10W 22K	1	
R6805	ERJ3GEYJ123V	1/10W 12K	1	
R6807	ERJ3GEYJ223	1/10W 22K	1	
RX6801	EXB28V220J	RESISTOR-RESISTOR	1	
RX6802	D1H81234A024	RESISTOR-RESISTOR	1	

Remote control

Instructions for operations are generally described using the remote control.



- ① Turn the unit on
- ② Input select (AV1, AV2, AV3 or AV4)
- ③ Select drive (HDD, DVD or SD)
- ④ Select channels and title numbers, etc./Enter numbers
- ⑤ Cancel
- ⑥ Basic operations for recording and play
- ⑦ Show Top menu/Direct Navigator
- ⑧ Smart Wheel (➡ below)
- ⑨ Skip the specified time/Display the television image as a picture-in-picture
- ⑩ Show sub menu
- ⑪ Show status messages
- ⑫ Buttons for switching between Video/Picture and Video/Playlists, manual tuning settings
- ⑬ Show on-screen menu
- ⑭ Start recording
- ⑮ Change recording mode
- ⑯ Transmission window
- ⑰ Television operations
- ⑱ Channel select
- ⑲ Show G-CODE screen
- ⑳ Skip 30 seconds forward
- ㉑ Show timer recording programme screen
- ㉒ Show FUNCTIONS window
- ㉓ One touch transfer (dubbing)
- ㉔ Return to previous screen
- ㉕ Create chapter
- ㉖ Erase items
- ㉗ Timer recording standby/release
- ㉘ Select audio

Note

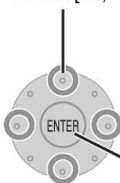
- Buttons such as the [● REC] button do not protrude as much as other buttons to stop them from being pressed accidentally.
- The word "button" is not used in these operating instructions so "Press the [ENTER] button." is shown as "Press [ENTER]."
- You can use this remote control to operate your television if you set the television manufacturer code.

Smart Wheel operation

- Select items on menu screens and set items.

Press [▲, ▼, ◀, ▶] (up, down, left or right) to select an item.

You can also turn the wheel to select an item.



Press [ENTER] to confirm.

These operations are also possible.....

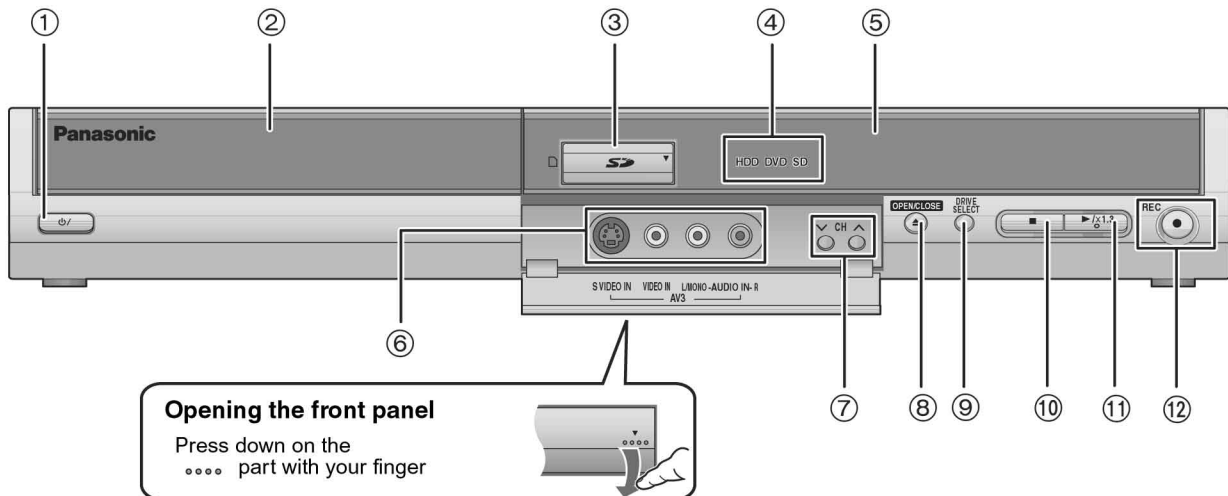
- Frame-by-frame (backward/forward):**
While paused, press [◀■] or [■▶] (left/right)
- Search (forward/backward):**
During play, turn right or turn left
- Slow-motion (forward/backward):**
While paused, turn right or turn left

Note

Press the Smart Wheel lightly when turning it.

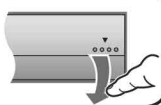
If you press it strongly when turning it, [▲, ▼, ◀, ▶] may be mistakenly activated.

Main unit



Opening the front panel

Press down on the
.... part with your finger



① Standby/on switch (⏻/⏻)

Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.

② Disc tray

③ SD card slot

④ Lights when the HDD, DVD or SD drive is selected

⑤ Display (➡ below)

⑥ Connection for camcorder etc.

⑦ Channel select

⑧ Open/close disc tray

⑨ Select drive

Drive changes each time you press [DRIVE SELECT].

⑩ Stop

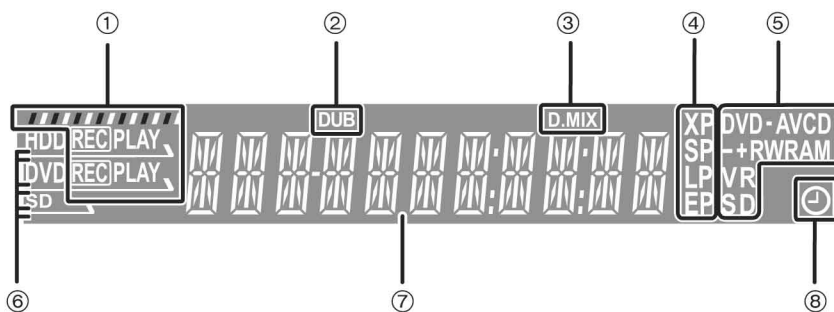
⑪ Start play

⑫ Start recording/Remote control signal sensor

Specify a time to stop recording

Rear panel terminals

The unit's display



① e.g., **HDD**



② Transferring (dubbing) indicator

③ D.MIX (multi-channel DVD-Audio only)

When lit: Down-mixing is possible.

When off: The disc prevents down-mixing so only the two front channels can be played

④ Recording mode

⑤ Disc type

⑥ Lights when the HDD, DVD or SD drive is selected

⑦ Main display section

⑧ Timer recording indicator